

ACTS FACTS

THE MONTHLY NEWSLETTER FROM

ARTS, CRAFTS AND THEATER SAFETY (ACTS)

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PHONE 212/777-0062

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ACTS wishes you a healthy, happy 2013

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ELECTRIC INTAGLIO PRESSES INHERENTLY DEFECTIVE?

Confidential source

Due to a confidentiality agreement, I can't tell you where, who, or exactly when in 2012 a university printmaking student who was guiding a plate with his right hand through an electric intaglio etching press caught his right forefinger in the roller. His finger's first joint (distal phalange) was torn off. The school will convert their two electrically powered presses to manual operation.

An internal report revealed there were two previous accidents at this school on intaglio presses when people's fingers got into the space between the bed of the press and the metal stop that prevents the bed from rolling off the back. This type of accident was addressed when the school provided a guard composed of blocks of wood and a magnetic stop to prevent a finger accessing this location.

COMMENT. First, the manufacturers of this electric press did not consider the Occupational Safety and Health Administration's (OSHA's) guarding regulations. If fingers can get in a location where they can be injured during operation, a guard *must* be installed to prevent it. However, the school's report noted that the representative of the press company said that various attempts to guard the rollers of the press and all were found unworkable. If this is true, the company's reaction should not have been to sell the press anyway. In this editor's opinion, the manufacturer is negligent.

Second, the school where this accident occurred has refused to release the report for publication. Although this school may put guards in place, others will not even be aware that guards are needed.

In my experience, faculty members demand proof that anyone has been injured before they will give up their ancient machines and chemicals. Without data, I can't convince teachers that aquatint boxes have exploded, people have permanent lung damage from Dutch mordant etching, typesetting and letterpress operations have caused high blood lead levels in teachers and students, and more. Even though I have seen this data, I can't document it for them. So many of the hundreds of schools I have inspected or whose buildings I have planned are needlessly hazardous.

I even know school safety personnel who are not allowed to investigate and report student accidents, even internally. Failure to report an employee accident is an OSHA violation, but failure to report a student accident is not. This means that even if a particular accident occurs repeatedly, the lawyers representing injured students will not be able to find any reports to establish the school's negligence. These schools have a chosen, deliberate policy to remain unaccountable for their students' safety.

TOXIC LEAD PIGMENTS & GROUNDS: POPULAR AGAIN

SOURCE: www.NaturalPigments.com

Safety professionals have asked ACTS about an increased use of lead white-pigmented oil paints and grounds in colleges and universities. As far as I can determine, this impetus is coming from pigment sellers and from a segment of professional artists who think that lead carbonate is the best white pigment for oil painting. These companies and artists seem to trivialize the toxicity of lead carbonate to both the environment and to people exposed to even very small amounts by inhalation, ingestion or skin contact.* This attitude is illustrated by a poem sent by Natural Pigments this season, entitled: *I'm Dreaming of a Lead White Christmas.*

*I'm dreaming of a Lead White Christmas
Just like the ones I used to know
Where the highlights glisten,
And the paintings hasten
To dry in time for the art show.*

*I'm dreaming of a lead white Christmas
With every portrait that I paint
May your paint be stringy and bright
And may all your Christmases be lead white.*

Whether or not lead is the best white pigment which also makes paints dry faster is irrelevant in the light of its toxicity. As I have explained to some advocates for lead white, toxic PCBs are without doubt the very best ever additives for acrylic paints, caulks and plastics. PCBs serve as plasticizers, fire-retardants and preservatives all in one. But they are highly toxic. Substitutes for PCBs that are "almost as good" are now used instead. And there are substitutes for white lead pigments that are "almost as good." Some experts

even think the substitutes may be better with respect to the historic yellowing or aging of oil paints.

Responsible artists, teachers, and the safety professionals in schools should replace lead-pigmented art materials. If, for some reason it is decided they must be used, the school is required to institute a written Occupational Safety and Health (OSHA) Lead Standard Program, especially if there is any possibility of the lead getting airborne. For example, if the pigments are purchased dry and mixed into paints, or if artists sand the layers of ground or paint, this program would require the school to quantify the exposure levels, usually by personal air monitoring, for all potentially exposed people. This includes monitoring the custodians who clean areas where lead dust may be generated.

If the air samples show amounts of lead above the OSHA air quality action limit, the precautions required will vary depending on the actual levels found. Precautions may include special clothing, training, cleanup, showers and changing rooms, and even monitoring of employees' blood lead levels. If, instead, air sampling shows that the exposures are below the limit, these test records must be kept and the air sampling must be repeated every time processes, materials, or personnel change. Documented training about lead hazards also must be provided whether levels found are high or low.

I think the sellers of lead pigments are aware that these OSHA regulations do not apply to individual artists working in their private studios or homes. But it would be ethical for them to alert customers who are covered under the OSHA regulations. Meanwhile health professionals should be prepared for faculty members who will resist any limits on their use of lead materials.

* FOOTNOTE: Skin absorption references

1. S.G Lilley, T.M. Florence, and J.L. Stauber: The use of sweat to monitor lead absorption through the skin, *Science of the Total Environment* 76:267-278 (1988) & *The Lancet*, "Skin Absorption of Lead," July 16, 1988, p. 157-158.
2. J.L. Stauber, T.M. Florence, B.L. Gulson, and L.S. Dale: Percutaneous absorption of inorganic lead compounds, *Science of the Total Environment* 145:55-70 (1994)
3. Chee-Ching Sun, et. al. Percutaneous Absorption of Inorganic Lead Compounds, *AIHA Journal*, Vol. 63, September/October 2002, pp. 641-646.

GOOD ARTICLE ON LUSTERS—EXCEPT FOR ONE SENTENCE

SOURCE: "Lusters," Johanna DeMaine, techno file, *Ceramics Monthly*, January 2013 pp. 12-14

A well-written article on luster and resinate luster glazes was published in *Ceramics Monthly*. It provides a column that accurately defines terms and has a "Toxicity and Safety" section. Unfortunately, the hazards discussed were restricted to those of the solvents and other organic chemicals. The only line about the metal fluxes in the glaze was the following sentence: ***"The glaze can be either lead- or alkaline-based frits that are non-toxic and non-soluble."***

Clearly, it is time again to remind people that these frits are not any safer than raw lead compounds.

WHAT ARE LEAD FRITS? Frits are made by melting raw lead compounds, silica, and other ingredients into a glass and reducing the glass to a powder. This is done in the mistaken belief that fritting, which makes the lead less soluble when tested with acids, is now safe to inhale and ingest.

This myth began in Britain in the late 1800s. Deaths from lead poisoning in the British pottery industry were greatly reduced when raw lead compounds were replaced by insoluble lead frits. Thereafter, acid solubility tests were accepted worldwide uncritically and with no supporting experimental data. Also unstudied were the effects of other measures that were introduced by British potteries at precisely the same time frits were introduced. These measures were ventilation, wet cleaning, hand washing, protective clothing, and other hygiene practices. These changes in hygiene were actually the precautions that reduced the numbers of overt poisonings and deaths. However, poisoning and high blood lead levels were reduced, not eliminated by the hygiene measures.

ANIMAL DATA. In 1985, the acid solubility theory was finally tested directly. The investigators first compared the solubility of lead disilicate and lead monosilicate frits with raw red lead in acid. Then they exposed rabbits to these substances by ingestion and by inhalation and plotted their blood lead concentrations against time (six days for exposure by ingestion; over 12 days for exposure by inhalation). The study concluded the frits did not behave differently from raw red lead in the body. Moreover, the acid solubility of a frit could not be used to predict its degree of absorption into the body. In a translation from the Italian, the authors concluded, "We therefore call for attention against the unjustified [sic.] feeling of safety that often accompanies the use of such compounds."¹

HUMAN DATA. The ceramic industry did not accept this animal data. It took human poisonings to convince them. Poison Control Centers in the United States have reports of hundreds of human ingestions of lead glazes over the years. There were 318 cases reported in 1991 alone. These ingestion incidents were not followed up by medical monitoring because the doctors and poison control personnel believed the manufacturers' nontoxic label and thought it unnecessary.

Then in 1992, one nursing home patient swallowed some glaze labeled "lead-free" and her symptoms were not ignored. This patient's blood was tested and it was proven that the lead was absorbed.² The significance of this event was understood by Dr. Woodhall Stopford, toxicologist for the Arts and Creative Materials Institute, the largest certifier of art and hobby products in the US. At that time, Dr. Stopford was certifying glazes containing acid-insoluble lead frits as "non-toxic" and "lead-free!"

In a deposition in a 1997 lawsuit in which several glaze manufacturers were being sued for allegedly causing brain damage in a child whose mother used lead glazes during her pregnancy, Dr. Stopford referred to the 1992 nursing home incident in the following exchange:

Dr. Stopford: And at that time one of the glazes that was being used was in the low soluble category and its ingestion was associated with an elevated blood lead level.

Question: Say that to me again in layman's terms?

Dr. Stopford:it appeared that the categorization between insoluble and soluble did not really have meaning from a toxicologic basis.

Question: Did it have any meaning for the consumers?

Dr. Stopford: Well, it's apparent that they would be at risk if they ingested either soluble or insoluble lead glazes.³

The existence of both animal and human data made it easier for people poisoned by lead frit glazes to sue for damages. I was retained as an expert in two of these cases in 1997.^{3,4} But neither the research nor the lawsuits kept lead glazes out of schools or hospitals. In 1992, the Centers for Disease Control reported on a number of ingestion incidents by patients including one in which the patient died from lead poisoning in Pennsylvania.² In 1997, there were still more of these incidents and another death in North Carolina.⁵ The ACMI put out another warning to hospitals and nursing homes in 1997.

TODAY, lead glazes still are used without following the OSHA Lead standard in many public schools, university art departments and in small businesses. And it is unthinking, uncritical editors of technical publications like *Ceramics Monthly* that help perpetuate this practice.

FOOTNOTES

1. "Lead Silicate Toxicity: A Comparison among Different Compounds," Sartorelli, et al, (University of Siena), *Environmental Research*, 36, 420-425, 1985.
2. *Morbidity and Mortality Weekly Report*, Centers for Disease Control, October 23, 1992 Vol. 41, No. 42 pp. 781-783
3. Deposition: 4-1-97 page 69 (*Ashley Rose Witt, a minor, by and through her mother and natural guardian, Patty Moore and Ronald Witt vs Duncan Enterprises; American Art Clay, Co.; Mayco Colors, Inc.; C and R Products, Inc.; and Robert R. Umhoefer, Inc.*, in the Circuit Court, Sixth Judicial Circuit of Florida, Pinellas Co., Civil Division, No. 92-5392-CI-20). Settled for ~\$500,000.
4. Both the case referenced in footnote 3, and the case of: *Sherrell McClendon wife of and Richard A. Duggan, Jr., individually and as natural tutors of the minors, Richard A. Duggan, III, Jordan E. Duggan, & Michelle L. Duggan. vs Duncan Ceramics D/B/A/ Duncan, Mayco, D/B/A Mayco Colors, & Allstate Insurance Company* USDC No. 94-2183 (US Dist. Ct., Eastern Dist. of Louisiana). Settled for ~\$865,000. (Note: the author was retained as an expert witness for the Plaintiff in both the Duggan & Witt lawsuits. Dr. Stopford was an expert for the Defense.)
5. Press Release, ACMI, Inc., Boston, *Institute Items*, 39(4), Dec 1997

ACTS FACTS sources: the *Federal Register (FR)*, the *Bureau of National Affairs Occupational Safety & Health Reporter (BNA-OSHR)*, the *Mortality and Morbidity Weekly Report (MMWR)*, and many other publications. Call for information about sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: John Fairlie, OES.

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BRAZIL'S KISS NIGHTCLUB FIRE KILLS 237

SOURCES: Recent reports from BBC, Aljazeera, Voice of America, CNN, and AP wire in 2004.

On January 27, another tragic nightclub fire occurred. Blamed were a combination of pyrotechnics, overcrowding, and combustible ceiling materials. According to eye witness reports from patrons of the Kiss nightclub in Santa Maria, Brazil, the band set off fireworks, the ceiling caught fire, thick acrid black smoke engulfed the place as people tried desperately to get out. About 50 bodies reportedly were found in the bathrooms because those doors were mistaken for exits. On February 3rd, a man died from burns raising the death toll to 237. There are still 101 people hospitalized.

Except for the chemical, construction, and oil industries, entertainment is the only other industry that not only kills its own workers, it takes significant numbers of civilian casualties. Here's a quick list of similar nightclub fires all involving pyrotechnics and flammable ceilings:

January 2013 Santa Maria, Brazil: 237 + dead	January 2009 Bangkok, Thailand: 64 dead
August 2012 Phuket, Thailand: 4 dead	April 2008 Quito, Ecuador: 14 dead
December 2009 Perm, Russia: 156 dead	December 2004 Buenos Aires, Arg.: 194 dead
January 2009 Changle City, China: 15 dead	February 2003, Warwick, RI: 100 dead

WHO IS AT FAULT? Most countries have laws prohibiting the conditions that caused these fires, but most countries are not enforcing them. And when a fire occurs, they punish the wrong people. For example, after the Rhode Island fire, one of the club owners was sentenced to 4 years in prison which was appropriate. But I do not think the pyrotechnician should have received the same sentence. He was a 26 year old roadie with no formal training, who had been taught to shoot pyro in a parking lot, who probably would have been fired for refusing to do this, and who was promoted for doing this by the band's agency. The agency, band members, both club owners, and the company selling the pyrotechnics all knew the young man was unlicensed. (I testified in defense of this man.)

I also think charges should have been filed against the Fire Marshal. He had not inspected the club for several years. Yet a few years before he had cited the club on two occasions for installing the front exit door to open in rather than out which should have been a red flag. And in a town of only 40,000 inhabitants, the Fire Marshal had to know or should have known the club regularly shot pyrotechnics and was often overcrowded. Years earlier, the club paid the Marshal to be on the premises when the crowd exceeded their occupancy limits. But the club stopped calling him even though they were doing more business and the Great White concert the night of the fire was a highly publicize event that was expected to bring a huge crowd.

In contrast, after the 2004 Buenos Aires fire, the man who both owed the club and promoted the concert was given 20 years and the band's manager and a high-ranking police official each received 18 years. Two city inspectors were given two-year sentences for dereliction of duty. Argentinian officials understand that blame should be assigned to the people who **plan, promote, and/or profit from the dangerous event or who have the power to prevent the tragedy.**

IMPACT OF THE UCLA AGREEMENT

SOURCE: Neal Langerman, "The Impact of the 'UCLA Agreement,'" *Journal of Chemical Health & Safety*, Am. Chem. Soc., Nov./Dec. 2012, pp. 45-46.

Neal Langerman, owner of Advanced Chemical Safety and nationally recognized safety expert, wrote a column in the *Journal of Chemical Health & Safety* that every college teacher and administrator should read. The column covers the implications of the Agreement between the University of California Board of Regents and the Los Angeles County District Attorney. This Agreement resolves the criminal charges for a lab accident that caused the death of a graduate student in 2008.

The July 2012 Agreement requires the same precautions that have been mandated by the California OSHA and federal OSHA occupational regulations, the very regulations UCLA should have been following for the last 20 years. But UCLA, like most universities, did not comply fully with the these regulations. Now the charges against the Regents have been dropped provided they will follow the rules as outlined in this Agreement.

But Neal Langerman went deeper into the Agreement's wording to show how it apportions the responsibility for safety of three entities: The Faculty, the Environmental Health and Safety Department (EH&S), and the Regents or administrators.

1. FACULTY. The Agreement makes it clear that it is the professor under whose watch this accident occurred who has primary responsibility. In the language of Laboratory safety, this faculty member is called the Principle Investigator or PI. The PI is equivalent to the captain of a ship. While he can delegate safety tasks to others, if anything goes wrong, the PI is ultimately responsible. The PI cannot engage in research or have chemicals in his lab that he does not understand and which cannot be used safely under conditions there. He cannot allow students who are not sufficiently trained to use those chemicals and equipment safely. And it is his responsibility to either train them or to see that they are trained and protected. The Professor at UCLA is still awaiting trial and faces three felony charges and a possible 4 ½ years in prison.

2. EH&S DEPARTMENT. Second there is the technical support staff which is usually the school's Environmental Health & Safety office. The Agreement relegates them to the role of consultants whose mission it is to provide technical guidance to the PI. They can be the outside observers that are responsive to the needs of the PI and the students. They can advise the PI when things are not going well. They can provide training, inspections, incident investigation and follow up. But it is the PI who is responsible for seeing it gets done. EH&S is **not responsible** for safety in the lab.

3. ADMINISTRATORS. These administrators include the Board of Regents, Department Heads, Deans, Provosts, Chancellors and Presidents. The Faculty Senate also assumes some administrative responsibility in that it represents the intellectual and functional interests of the faculty. While it was not stressed in Langerman's article, it should also be noted that it is the "school," as represented by the administration, that is cited for violating any occupational law violations and must pay the fines for acts committed by the school's employees. The Occupational Safety and Health Administration (OSHA) also recognizes that the school is the "employer" who is ultimately at fault for accidents.

APPLICATION TO OTHER STATES. While this California Agreement applies directly to the UCLA chemistry and biochemistry departments, it sets a national minimum due diligence standard for safety organization and performance that all universities should follow. In fact, a more detailed

version of this same structure of responsibility is in the updated non-mandatory Appendix to the federal OSHA Lab Standard (78 FR 4342-4331) published in the Federal Register on January 22.

ART DEPARTMENTS. College art studios are defined as “academic laboratories” under the EPA waste regulations (e.g., Subpart K) and most schools have the option of putting their art department training and safety programs under either the OSHA Laboratory Standard or the Hazard Communication Standard. The responsibility guidelines in the Agreement are applicable to art, too.

COMMENT. I am relieved and pleased to see Langerman’s clear explanation of the Agreement because there has been an assumption in colleges that safety was the job of the experts in the EH&S department. Yet never have I seen a school provide these experts the money or authority to address safety properly. Most of my EH&S colleagues waste their precious time on strategies to get reluctant and recalcitrant faculty and students to follow the rules or to come to training. Yet those rules and the training are mandatory. It is the administration that permits the faculty to consider them optional by citing academic freedom, or by assuming the faculty must already know about safety, or because administrators do not want to confront or anger faculty or students. Basically, no one has been truly in charge of safety in most universities and colleges for decades.

It was also heart-warming to see that the duties of EH&S include providing training, inspections, incident investigation, and follow up. I hope this will be understood by the **many** universities whose administrators do not allow EH&S to investigate and follow up accidents for fear of generating paperwork that could be used to prove negligence in future lawsuits. I have always thought this was a counterproductive and even criminal policy. Now it actually may be so.

JOBS LINKED TO ASTHMA

SOURCES: www.bbc.co.uk/news/health-21123204, “Cleaning products linked to asthma”, 1/21/13; www3.Imperial.ac.k/newsandeventspggrp/imperialcollege/newsummary/news_21-1-2013-16-36-46, “Cleaning jobs linked to asthma risk”; & other news reports.

In a recently published study, researchers retrieved data on nearly 9,500 adults born in 1958 taking part in the National Child Development Study, which is tracking the long term health of over 11,000 people in Britain. The analysis excluded some 2,000 participants who reported having symptoms of asthma before the age of 16 and concentrated on adult onset asthma only. Of these, nine percent developed asthma by age 42. Risks in the workplace were responsible for one in six cases of adult onset asthma – even more than the one in nine cases attributed to smoking, according to the analysis.

Published in the medical journal, *Thorax*, the study identified 18 high-risk jobs, four of which involved cleaning and three more job classifications which were likely to involve cleaning materials. For this reason, cleaning materials were the single category of product most associated with asthma.

The study identifies flour, enzymes, metals and textiles as well as cleaning products as among workplace materials linked to asthma risk. These materials have been linked to asthma in many other studies. The authors write that, “Approximately 16% ... of adult onset asthma was associated with known asthmagenic occupational exposures.”

Considering risk only by job categories, farmers were at the top of the list. They were around four times more likely to develop asthma in adulthood than office workers were. Farmers were followed by aircraft mechanics and printers (typesetters). General cleaners, office cleaners, domestic helpers and care workers, hairdressers and laundry workers were also featured.

However, when the researchers looked only at lung function tests (i.e., excluded the self-reported data and considered only asthma victims with more severe impairment), they found only 4 of the 18 occupations were significantly linked to raised risk of adult asthma. These were office and hotel cleaners, doorkeepers (an undefined British term that may refer to security guards and bouncers), manufacturing labourers, and “hand packers” (warehouse workers).

COMMENT. This is just one more study confirming what researchers have known for many years, that is, occupational exposures are risk factors in adult onset asthma. The use of cleaning supplies which contain detergents and solvents clearly are another factor.

SCIENCE LAB MISHAP SICKENS 17 PEOPLE

SOURCE: <http://newyork.cbslocal.com/2012/12/04/science-lab-mishap-sickens-17-people-at-hudson-valley-high-school/> CBS New York/AP wire

A chemical mishap on December 11, 2012, in a New York high school science lab sent more than two dozen people to hospitals to be checked out and forced the evacuation of the school for a day.

The Highland Falls-Fort Montgomery School District announced on its Web site that at O’Neill High School in Fort Montgomery, 27 grams of ammonium chloride were placed in distilled water, and allowed to dissolve in the fume hood on a hot plate during a teacher-led demonstration. The hot plate was supposed to be turned off, but it was inadvertently left on, and the water and chemicals evaporated into a “billowing fog,” the school district said.

The local fire department responded to the scene, and exhaust fans were placed in the lab to clear the area. Everyone was evacuated from the school.

COMMENT. Ammonium chloride was used (and unfortunately occasionally still is used) as a theatrical smoke. One brand was sold under the name “Smoke Cookies.” These little cookies were placed in a brasier and heated to release the billowing smoke described in the article. However, a 1983 NIOSH workplace study at a New York Theater showed that ammonia was also created by this Smoke Cookie effect. The air was not tested for acids, but it is known that when this chemical releases ammonia, an equal amount of hydrochloric acid is created. So in addition to somewhat irritating white ammonium chloride fume particles seen as “smoke,” there also would be small amounts of ammonia and hydrochloric acid in the air. It was reasonable to evacuate the school.

ACTS FACTS sources: the *Federal Register (FR)*, the *Bureau of National Affairs Occupational Safety & Health Reporter (BNA-OSHR)*, the *Mortality and Morbidity Weekly Report (MMWR)*, and many other publications. Call for information about sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: John Fairlie, OES.

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42 SENIOR ART STUDIOS DESTROYED BY FIRE

SOURCES: *DNAinfo.com* New York, "Massive Pratt Institute Fire Destroys Student Work", 2/15/13; *New York Times*, "Fire at Pratt Institute Destroys Studios..." 2/15/13; *Daily News*, "Pratt Institute hit hard by early-morning four-alarm fire..." 2/15/13; *NY Post*, "Electrical wires eyed in Pratt Institute fire," Kirstan Conley, 2/19/13 & *PIX11* reports on 2/15/13 and 2/18/13.

The top floor of Pratt Institute's 126 year-old Main Building erupted in flames in the pre-dawn hours of February 15th. Destroyed were the priceless student works housed in 42 senior studios on the sixth floor and various classrooms, studios, and some administrative offices on the fifth. The building is a Romanesque Revival brick fortress that is landmarked and on the National Register of Historic Places. The interior is wood. The fire gutted the sixth floor and part of the roof caved in. The floor below is severely damaged by fire and water and there is water damage to all lower floors.

Interviews with students were heart-breaking. Students told of the loss of six to eight months of works often costing thousands of dollars for paint and materials. Most work was ready for their finals or to sell for tuition. Two firefighters sustained injuries during the two-hour, four alarm fire.

Various on-lookers interviewed at the site speculated that oily rags, paints, or electrical wiring may have been the cause. Three days later, a retired police Detective Sergeant Wally Zeins, said fire investigators believe the fire's cause was electrical in nature and may have been caused by something plugged into an outlet in the building.

COMMENT. I have seen well over a hundred similar buildings on campuses all over the country in the last 15 years. While some student's studios are clean and orderly, most are filthy and paint rags abound. Some are so cluttered there is no place to walk in them. Cans of flammable solvents and aerosol spray cans are usually amid the clutter. The floors are often inappropriate for these materials and are wood boards with cracks between them which are stained with oil and paint. Appliances of every type and condition are plugged into overloaded outlets, power bars, and extension cords. Students haul in upholstered sofas, hang curtains at doorways, and fill their cubicles with combustible items that should never be allowed in solvent-using areas.

These conditions exist in part because usually these students are not trained about the hazards and they have unsupervised 24-hour access to their studios. They even may work alone. This may have been how studios at Pratt were operated. While one news report says that Main Hall was usually empty by 9 pm, PIX11 reported that "The building is normally open to students around the clock."

These old buildings rarely are sprinkered and some have no smoke or heat detectors. In fact, PIX11 TV said that their sources told them that at Main Hall "there are no sprinkler systems on the sixth floor where the fire started. There was no burglary, but apparently sources say a burglar alarm wire caught fire and tripped the alarm notifying security who then notified the fire department."

Perhaps the only unusual thing about this fire is that it didn't happen years ago.

ART INSPECTOR DESCRIBES ART SCHOOL CONDITIONS

SOURCE: http://www.huffingtonpost.com/danielle-siembiedagribben/art-inspection_b_2775253.html

The Huffington Post's Arts & Culture section ran an article on February 27th titled "The Art Inspector: Saving the Earth by Changing Art." It's about Danielle Siembieda-Gribben, who started something she calls a "social practice artwork" during her Masters in Fine Arts candidacy at San Jose State University (www.twitter.com/Art_inspector). Her program has three sections: Healthy Art (education), Legislative Reform (advocacy), and Third Party Inspections (studio assessments).

Clearly, she is self-educated about environmental issues in art, but she is an example of how much can be done if one student takes the time to try to improve conditions in their school. In fact her account of what compelled her to take this approach is a perfect description of what I see in almost every school art department I inspect:

This project started a few years ago when I noticed fellow studio mates as well as the art school itself seemingly unconsciously teaching and using harmful applications and techniques, disposing of waste, and ineffectively ventilating rooms. I noticed piles of plastic thrown into dumpsters, studio lights left on for what seemed 24 hours at a time, and complete negligence when using harsh chemicals. In my studio, a rusty cabinet labeled "Store Harsh Chemicals Here" written upon faded masking tape hosted a dusty plastic binder labeled MSDS Sheets. Taking a closer look, I realized no one had taught me what Material Safety Data Sheets meant and how they might apply to what I do. I asked around to other artists what they might know about these sheets and what they thought about what they were using and how they were disposing of extra material. Many artists noted that they knew someone, or had experienced themselves, long term health problems from misuse of chemicals in the creation of artwork. Most artists intuitively believed that there was a better way to develop their work and acknowledge the harm of some of the materials, but did not know what to do about it or did not see change as a high priority.

Reading this, you can see that Danielle's school did not follow the OSHA regulations that require training about MSDSs, fire and chemical storage, and other safety rules. While Danielle's program is aimed primarily at environmental issues and she seems to assume incorrectly that products that are safer for the environment will also be safer for the artist, she is still making an important difference. ACTS applauds her work and wishes the project well.

LYRIC OPERA FIRE BLOWER INJURED

SOURCES: Associated Press releases, February 4, 5, & 23, 2013

The AP wire service reported that a Chicago opera performer's face was burned after he "blew fire" during a dress rehearsal on February 4th. Wesley Daniel, age 24, was wearing a flameproof costume and mask during the dress rehearsal at which there was an audience of hundreds. Witnesses said Daniel staggered to the wings and fell to the floor. He was taken to Loyola University Medical Center on the 4th, released on the 7th and cleared to return to work on the 23rd. Reports vary on the severity of his burns. Some say it was more like a sunburn while others claim his throat was also burned. I leave it to readers to consider that Daniel was not medically cleared for work for 19 days.

An opera spokesperson said the fire effect was approved by the Chicago Fire Department, but will be eliminated from future shows. The Occupational Safety & Health Administration is investigating.

COMMENT. Circus fire blowers usually fill their mouths with solvents such as kerosene, lighter fluid or ethyl alcohol and blow solvent mist over a torch to create a huge flame. A lot of practice is required. The fact that the news reports say that Daniel used alcohol may be a clue to the accident's cause since alcohol is more flammable than the other solvents and more likely to flash back.

UNPREDICTABLE FIRE ACCIDENT AT OREGON HOSPITAL

SOURCES: http://www.oregonlive.com/health/index.ssf/2013/02/hand_sanitizer_olive_oil_to_bl.html , *The Oregonian*, Nick Budnick, 2/20/13

Several practices at Doernbecher Children's Hospital, an Oregon University Health and Science facility in Portland, combined to cause a serious accident. First, the hospital installed hand sanitizers in accordance with industry standards. Then they began using olive oil to remove tape residues from the skin of patients who were allergic to the solvents in commercial gel removers.

THE STORY. Ireland Lane, who turned 12 on February 21, was diagnosed with a rare childhood kidney cancer six years ago and was treated successfully. On February 2nd, she was in Doernbecher Hospital for evaluation after hitting her head at school and losing consciousness. Olive oil was used to remove the glue that held electrodes to her scalp for an Electroencephalography (EEG) exam. The oil was combed through her hair and the girl was seen running her hands through her hair and wiping them on her shirt. According to an investigative report which *The Oregonian* newspaper obtained under the Oregon Public Records Law, the girl's T-shirt was "saturated" with the oil and sanitizer.

Shortly after this, the girl began playing with the bed clothes by scuffing her feet on the floor to generate static electricity and playing with the sparking effect this caused. The girl's shirt ignited causing second- and third-degree burns over 19% of her body. She has already had one skin graft. Fire investigator Daniel Jones wrote in the report: "The ignition source would not have been adequate to ignite the olive oil on the shirt without the presence of the hand sanitizer as well."

PROTOCOL CHANGES It would be difficult to blame the hospital for not foreseeing this highly unusual accident. However, hospital procedures after the fire may have to change. The fire was too small to activate the fire alarm or sprinkler systems. The fire marshal said the staff should have activated the fire alarm system manually, should have initiated "code red" page for the building, and should have evacuated other patients from the smoke compartment of the fire. Instead, they simply put out the fire themselves and one person was slightly injured in the process.

The staff is reviewing their fire response procedures and other protocols. "We are no longer suggesting the use of olive oil for patients who have an allergic reaction to EEG gel remover," said Dr. Stacy Nicholson, physician-in-chief of Doernbecher's. "In addition, while our placement and use of hand sanitizer meets industry standards, we plan to review our procedures to see if there are any additional adjustments we can make to promote safety."

COMMENT. Although the alcohol in the sanitizers and the olive oil are "natural" substances, they are still flammable and combustible liquids respectively. We also tend to forget this fact in kitchens where the risk of fire is even greater.

HIGH SCHOOL SECURITY GUARD STEALS BOMB-MAKINGS

SOURCE: http://bostonherald.com/news_opinion/local_coverage/2013/02/mass_school_guard_faces_chemical_charges , AP, 2/28/13

A security guard at a suburban Boston high school has been arrested and charged with possessing chemicals that could be used to make a bomb. Authorities say 23-year-old Jesse Holland stole the chemicals, including iron powder, aluminum powder and magnesium metal ribbon, from Waltham High School, where he worked. He was arrested and police say Holland told them he intended to throw the chemicals into a fire to "see what would happen." Waltham Mayor Jeannette McCarthy called the allegations "troubling."

COMMENT. It is more troubling that these pyrotechnic chemicals are in the school and not secured.

SCIENCE PROJECT RESULTS IN HIGH SCHOOL LOCKDOWN

SOURCE: <http://www.tampabay.com/news/education/k12/chemistry-homework-puts-seminole-high-on-lockdown-deputies-say/1264539>

A chemistry class in a Seminole, Florida high school was given an assignment to bring an item to class that represents an element in the periodic table. On December 4, 2012, when the project was due, some students brought simple things like salt and water which are actually compounds rather than elements. Others brought real elements like aluminum foil or iron. But a few students brought in dangerous elements such as mercury, lithium, and sodium.

After seeing the chemicals, a teacher called the principal, who called authorities. The school was locked down for the first period while Hazmat investigators and firefighters checked the bookbags and lockers of 125 students assigned the project. About 10 projects with potentially dangerous chemicals were found.

Students interviewed by the local paper thought all this was an over reaction. But a mercury spill can be dangerous and require a costly clean up. Lithium and sodium elements can burst into flame on contact with air. These extremely hot metal fires can't be put out by ordinary fire extinguishers.

COMMENT. ACTS is concerned about where the chemicals were obtained. The mercury came in thermometers which their parents should have taken to household waste centers. The parents certainly should have known these were not items which should be taken to school. It was unclear where the lithium and sodium were obtained. We can only hope these were not also found at home.

ANOTHER FATALITY FROM WELDING A METAL BARREL

SOURCE: http://www.tulsaworld.com/news/article.aspx?subjectid=12&articleid=20121210_12_0_MIAMIO672844

A man died on December 9th in Quapaw, Oklahoma after cutting into an empty 55-gallon barrel which exploded according to Ottawa County sheriff's detective Derek Derwin. Troy Howard Thompson, 43, died at his residence around 10 am from massive injuries to his head, he said.

Thompson was using a plasma cutter to cut the barrel when the explosion occurred. Earlier in the morning, Thompson had successfully cut two other barrels, he said.

COMMENT. I've reported four of these accidents in the last few years because most college sculpture departments have cutting torches and students collect scrap metals for projects. I usually see 55- gallon drums or part of the drums lying around. The fact that the barrels with small amounts of oils or chemicals on them don't always explode can lead students to think it is not dangerous.

ACTS FACTS sources: the *Federal Register (FR)*, the *Bureau of National Affairs Occupational Safety & Health Reporter (BNA-OSHR)*, the *Mortality and Morbidity Weekly Report (M:AWR)*, and many other publications. Call for information about sources. Editor: Monona Rossol; Research: Tobi Zausner, Sharon Campbell, Robert Pearl, Brian Lee, Pamela Dale, Kathy Hulce, Pat F. Sheffield, Janet Sellery; Staff: John Fairlie, OES.

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ACTS FACTS

THE MONTHLY NEWSLETTER FROM

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April 2013

Vol. 27, No. 04

EVIDENCE THAT CARBON DIOXIDE IS AN INDOOR AIR POLLUTANT

SOURCE: *ASHRAE Journal*, March 2013

Every building planner, architect, industrial hygienist, ventilation engineer, school administrator and teacher should read two articles in the March *ASHRAE Journal* from the American Society of Heating, Refrigerating and Air-conditioning Engineers. While some of the information is technical, the graphics and conclusions can be understood by all. In summary they find that research now indicates adverse effects on intellectual performance in indoor environments may be attributable directly to carbon dioxide concentrations—concentrations previously thought to be within the range of those indicating acceptable fresh air ventilation rates.

BACKGROUND. Carbon dioxide, a gas which each of us exhales with every breath, has been the standard marker gas to determine ventilation efficiency. Comparing levels of CO₂ indoors with those found in local outdoor air is a standard method of determining if enough outdoor air is being drawn in to provide good air quality for occupants. It was assumed that at these fresh air levels rather than the CO₂ itself were directly related to the way people feel and function in buildings.

MEASUREMENTS. The ASHRAE 62 standard, “Ventilation for Acceptable Indoor Air Quality,” recommends ventilation systems be capable of maintaining CO₂ levels at 700 ppm or less above outdoor CO₂ levels. Depending on local conditions, acceptable outdoor air contains 300-500 parts per million (ppm) CO₂. A proper system, then, should keep CO₂ levels indoors to somewhere between 1000 and 1200 ppm. Since the occupational air quality standard set for adult workers is 5000 ppm, it has been assumed these lower levels are protective of the general population which would include children, the elderly and other higher risk groups.

Unfortunately, substandard ventilation systems are common. Studies of elementary school classrooms in California¹ and Texas² showed a substantial proportion of the average CO₂ concentrations exceeded 3000 ppm. Similar conditions probably exist in all states.

EFFECT OF CO₂ STUDIED. It has always been assumed that CO₂ is only an indicator of bad ventilation and is not in itself capable of causing cognitive effects at these levels. Various studies showing poor concentration and performance have always been thought to be the result of all the other building pollutants that clearly build up in the air when fresh air is restricted. Now a study in Hungary and reported in the *ASHRAE Journal*,³ casts doubt on this assumption.

The authors of this study subjected 22 adults to tests of decision-making performance when exposed to low, medium and high CO₂ concentrations for 2.5 hour periods in an exposure chamber. During the first session, the levels of CO₂ were approximately 600 ppm and the only CO₂ sources were the subjects themselves and outdoor air. Then these same subjects were given the same type of test when pure CO₂ was added to the chambers to raise the levels to first 1000 ppm and then to 2500 ppm.

THE PERFORMANCE TEST. The test used was the Strategic Management Simulations (SMS) test designed to assess complex cognitive functioning. The test is commonly used to determine the job level at which an employee would best function. It evaluates nine parameters of decision making to determine day-to-day productivity. In the tests, subjects are exposed to diverse computer-generated real-world-equivalent scenarios that match real-world challenges and convey the subject's decisions through a computer interface.

THE RESULTS. When compared to tests taken at 600 ppm, the tests taken at 1000 ppm showed a moderate and statistically significant decrement in six of nine scales of decision-making performance. At 2,500 ppm, large, statistically significant reductions occurred in seven of the areas of decision-making performance. The scales that were essentially unaffected by CO₂ levels were Focused Activity and Information Orientation. This same phenomenon has been seen in other laboratory studies and is probably attributable to the fact that paid subjects will exert more effort in the few hours of the test than they would exert routinely in the workplace.

OTHER TESTS. A second article⁴ in the March *ASHRAE Journal* provides an overview of the subject and references 16 studies of intellectual performance of adults and children against various parameters of ventilation efficiency. However, the authors note that "there is not enough space for all such references." These studies, the authors believe, place the magnitude of the negative effect of indoor environment on performance in the range of 5% for adults in the laboratory, and up to 10% in the field. The effects on school children are over 20%.

COMMENT. In 2004, when the pressure to conserve energy was becoming a bigger factor in building planning, ASHRAE lowered the amount of fresh air requirements for buildings. Even accepting their rationale in the ASHRAE 62-2004 standard requires better delivery of the air to the breathing zone of occupants than earlier standards, this change does not fully compensate for the fresh air reductions. For this reason, ACTS continues to recommend the earlier ASHRAE 62-2001 standard's higher fresh air requirements plus the better delivery methods in more recent ASHRAE standards. However, it is likely that an actual increase in the required amount of fresh air is needed.

1. "California portable classrooms study phase II: main study, final report, volume II." Whitmore, R., A. Clayton, G. Akland, *California Air Resources Board*, 2003.
2. "Carbon dioxide levels and dynamics in elementary schools: results of the TESIAS study." Corsi, R.L., et al. *Proceedings of Indoor Air*, 2002, pp. 74-79.
3. "Is CO₂ Indoor Pollutant?" Wm J Fisk, Usha Satish, Mark J Mendell, Tosifumi Hotchi, Douglas Sullivan, *ASHRAE Journal*, March 2013, pp 84-85. Contact ACTS at actsnyc@cs.com for information on obtaining this article.
4. "How Indoor Environment Affects Performance." David P Wyon, Powel Warocki, *ASHRAE Journal*, March 2013, pp 46-8, 50, 52.

THREE HORSES DIE ON "LUCK" HBO SET

SOURCE: 'Luck' raises stakes on animals' use, by Richard Verrier & Scott Collins, *Los Angeles Times*, 3-17- 2012, <http://articles.latimes.com/2012/mar/17/entertainment/la-et-0317-horse-safety-20120317>

Combining the well-known high physical risks at race tracks with the hazards on film locations has recently proven fatal to three horses. The low-rated drama starring Dustin Hoffman and Nick Nolte called "Luck" halted production on March 13th after the deaths of three horses used in filming raised ire among animal-rights activists. HBO said it couldn't guarantee more accidents would not occur.

The following week, the "odds" improved for the horses when HBO suddenly cancelled the show. Public relations is probably a factor in this decision. Animals are being used more widely in entertainment, while at the same time the public is more sensitized to their care and treatment.

The incident also put a spotlight on the American Humane Association, the nonprofit group that monitors more than 2,000 productions that use animals. The AHA vigorously defended its handling of the horses on "Luck." "I believe our oversight was really excellent," said Karen Rosa, senior VP of the AHA's film and TV unit. "These situations are extremely unfortunate and very rare in filmmaking, so I do take issue with the criticism."

The AHA's film and TV office has eight full-time animal safety representatives and an additional 32 on-call representatives across the country. The Screen Actors Guild contributes two-thirds of the \$3-million annual budget for the AHA's film and TV unit. The organization has monitored filmed entertainment for more than 70 years and often works with producers to review scripts and sends out inspectors to ensure that productions follow detailed guidelines contained in a 128-page booklet.

These guidelines outline proper procedures for handling everything from beetles and worms to lizards, horses and monkeys. Companies that comply receive the famous "No Animals Were Harmed" certification that appears in the end credits of features and TV shows.

An opposing view was expressed by the advocacy group People for the Ethical Treatment of Animals (PETA). PETA and other animal-rights activists have raised questions over the years about AHA's ability to protect animals on sets given its ties to the entertainment industry.

PETA investigator Kathy Guillermo, said whistleblowers on "Luck" alleged that AHA hired state-certified safety experts, but many of their recommendations were ignored by the show's producers and they were not part of the show after the first season. Guillermo also questioned the fitness of the horses to be used for filming, citing a necropsy report showing that one of the horses that died hadn't competed since 2007 and suffered from arthritis.

Dr. Rick Arthur, equine medical director for the California Horse Racing Board, disputed PETA's characterization of the necropsy reports, saying there was no evidence that the horses had been medicated prior to their injuries or were unfit for use in the show. Dr. Arthur and many other experts say that accidents will occur in racing and filming no matter how many precautions are taken. "If you spend any significant time at the track, you're going to see a horse break a leg," said Ted McClelland, author of the memoir "Horseplayers: Life at the Track."

Yet Steven Spielberg's World War I epic "War Horse," which used more than 100 horses, including 14 that played the title role of Joey, completed production without an animal injury. The film used computer-generated imagery (CGI) effects and an animatronic horse for one battle scene, but relied mainly on the real animals. Horse trainer Bobby Lovgren worked closely with AHA representative Barbara Carr to avoid injuries. "I gave her full power to pull the plug if she ever felt any of the horses were not up to the challenges or if she thought they would be injured in any way," Spielberg said.

PETA has been prodding studios to end animal performances and replace them with CGI techniques such as those done in "War Horse" or in last year's feature hit "Rise of the Planet of the Apes." The CGI process is more expensive and audiences sometimes reject what seems to be fakery, but it is clearly safer. The bottom line was provided by PETA's Guillermo who said, "As long as animals are dying on the set something is not being done right."

SUBSCRIPTION PRICE TO CHANGE IN 2014

We held the line as long as we could. In 2008, we set the price for *ACTS FACTS* at \$25/year for US subscriptions and \$28 for Canadian subs when the stamps cost \$0.42 and \$0.72 respectively. Now those stamps cost \$0.46 and \$1.10 respectively! Ouch. The Canadian stamp now costs the same as the stamps for our European subscribers who pay \$30/year.

The new 2014 rates will be \$30/year for US subscribers and \$35/year for all other subscriptions. But anyone who wants to subscribe for multiple years at the old prices can do so before December.

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You can check the code after you renew or send an additional payment and contact me if there is any problem: actsnyc@cs.com. Thanks. Monona Rossol, Editor.

CHINESE OPERA STAR SAYS SMOG IS DAMAGING HIS VOICE

“Top opera star Mei Baojiu: China smog is damaging my voice.” Tom Phillips, Shanghai, *The Telegraph*, 3-19-13, www.telegraph.co.uk/news/worldnews/asia/china/99401083/Top-opera-star-Mai-Baojiu-smog-is-damaging-my-voice.

Beijing opera singer Mei Baojiu spoke at a recent meeting of China’s top political advisory body, the Chinese People’s Political Consultative Conference. The 78-year old singer said, “My voice no longer sounds perfectly smooth and clear.” Mr. Mei also told an interviewer with the *Chengdu Business Daily* that, “Air pollution has ruined the voices of Peking Opera Performers.” Mr. Mei also made a pre-performance announcement to an audience saying a pollution-induced ailment “might affect his singing.” He is reportedly taking medication for respiratory irritation.

Mr. Mei is not alone in his concern. Other performing artists’ and a well-known filmmaker’s complaints are fueling public fury. Politicians are promising change, but Chinese environmentalists are not convinced that they will be able to institute the necessary reforms.

ACTS FACTS sources: the *Federal Register (FR)*, *Environmental Health Perspectives (EHP)*, the *Mortality and Morbidity Weekly Report (MMWR)*, and many other publications. Call for information about 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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LESSONS FROM THE FEDERAL REGISTER

Editorial

In 1987, this *ACTS FACTS* newsletter published its first issues. We intended to report primarily on items from the Federal Register. This is of great interest to me, but I can understand why readership would be extremely limited. So *ACTS FACTS* morphed into what it is now. However, underlying everything I write is a perspective obtained from daily reading of the FR.

WHAT IS IT? The FR is all the public documents published daily by all of the federal agencies including: meeting notices; agendas; the proposed, interim, and final versions of new regulations; announcements; legal settlements, and more. I look for information on chemicals and products published by EPA, FDA, and Consumer Product Safety Commission. I read everything from OSHA, the National Institutes of Health and the Chemical Safety and Hazard Investigation Board. I have even found items for the newsletter from the Department of Transportation, Homeland Security, the Anitrust Division, Energy Department, Federal Aviation Administration, Housing and Urban Development, the Geological Survey, and the Nuclear Regulatory Commission.

WHAT CAN YOU LEARN FROM THE FR? My addiction to the FR began in 1977 while working for a different organization. Back then, it was free to nonprofits (today the hard copy costs \$860/year). It also was difficult to read until I became fluent in governmentese.

But the most important thing I have learned reading the FR for 35 years, is how this big government worked—and why it now doesn't work. It isn't enough to know when something is broken. You have to know how it is supposed to function if you want to fix it. People who don't understand just want to junk all the broken agencies. This is foolish. In a short while, they would find they would just need to create a new agency to try to do what the old one was trying to do.

WHAT'S WRONG? The problem is simple. government agencies are operating with skeleton crews. All of the regulatory agencies had to let some of their work slide. So don't be surprised and outraged when you learn Homeland Security didn't even know that West Fertilizer existed until it blew up as result of holding hundreds of tons of a chemical they should have known was there. Or when EPA doesn't know a company is illegally dumping a chemical when everyone else seems to.

WHAT'S WRONG WITH OSHA? My interest is primarily in workplace safety, so I'm most familiar with OSHA. Over the years, the following policy changes destroyed OSHA's effectiveness:

1. TESTIMONY COMPENSATION. The turning point, in my view, occurred in 1981. Within days of taking office, President Reagan ended a program called "Compensation for Testimony." This program allowed agencies that were planning to institute a new regulation to find recognized experts on the particular issue that they proposed to address with a new rule. They could pay these experts

a reasonable sum to compensate them for the time to research, write, and present their testimony. I know the pay was small because I worked on a project like this in the late 1970s.

After this compensation program ended, the FR changed dramatically. No longer could you see an equal fight between experts for industry and nationally recognized experts speaking for OSHA's position. Now almost all of the opinions in the comments on new rules are those of industry's highly paid experts versus OSHA's overworked staff, who are primarily regulators rather than experts on specific chemicals or hazards. When OSHA loses the war of words, the attempt to institute a new rule either fails or the new rule is so damaged by concessions to industry that it is ineffective.

2. COZYING UP TO CORPORATIONS. The idea that OSHA should play nice with employers and help them to comply rather than citing them for failure to comply was foisted on OSHA. Most people are smart enough to be suspicious when regulators get too chummy with the people they regulate. But this conflict of interest was imposed on OSHA from the top. This collaboration with industry even established Voluntary Protection Programs (VVPs) that prevent OSHA from citing employer-members even if they knowingly violate regulations. These programs will work only if human nature DNA undergoes a major reorganization of the genes that determine self-interest.

3. EASY APPEALS. The appeal process was made easier for employers and harder for OSHA. Employers can appeal for years, draining OSHA's meager budget and manpower. I often track OSHA cases that take over five years to resolve.

4. OSHA'S FINES. These were kept so low they neither created revenue nor served as a deterrent. David Michaels, the current director of OSHA, says the maximum penalty for a violation that causes a "substantial probability of death—or serious physical harm" is \$7,000. The highest fine for a willful and repeated violation is \$70,000. That's chump change for big businesses like British Petroleum whose quarterly earnings are counted in billions. And small businesses are given even lower fines. The average fine for a small business employer who caused the death of a worker is \$6,000.

5. OSHA'S BUDGET. The country grew while OSHA didn't. They now conduct about half as many inspections as they did during the Reagan administration. David Michaels estimated that OSHA has enough inspectors to visit every workplace in the US once every 133 years.

6. PRIORITIES. OSHA was required to prioritize their inspections and enforcement activities. Worse, the process of choosing the priorities is subject to "public scrutiny" which actually means "industry's scrutiny." OSHA must prove, numerically and often in court, that their efforts are getting the biggest bang for the tax payer's buck. This might be fiscally sound, but it is disastrous for workers. For example, there is an undue concentration of OSHA's resources on safety issues and accidents because these incidents can be easily documented and proven. But occupational illnesses which take years to develop, and which are often unreported, are not being similarly addressed.

This problem is masterfully described in a three page article which starts on the front page of the *New York Times* on March 30, 2013. Written by Ian Urbina, its title is "As OSHA Emphasizes Safety, Long-Term Health Hazard Risks Fester." Urbana quotes OSHA's director when referring to the agency's record on workplace health threats as saying, "I'm the first to admit this is broken."

FIXING WHAT'S BROKEN. Well then, even the director agrees that OSHA is broken. Perhaps we should try to change some of the policies listed above. But in this economy, there is no way that a proper budget can be obtained. How can we have good regulations without paying for them?

Actually, there is a way to have enforcement for free. We can give citizens and workers more rights to investigate and report on safety. We know citizens can be effective. Both EPA and IRS have long-standing programs which compensate citizens who provide evidence of violations or crimes.

In another example, the State of California's Proposition 65 has a citizen's enforcement clause that sets the monetary penalties for failure to provide warning labels on products containing any of a long list of toxic chemicals. Qualified individuals, organizations, or lawyers who investigate these products and can provide proof of wrong doing to the State Attorney General can claim all or part of these fines, depending on whether the Attorney General takes the case or the qualified parties file suit against the manufacturer themselves. Even more importantly, the fines and expenses are paid by the violators. Not a cent is from tax payer's pockets.

CITIZEN'S ENFORCEMENT PROBLEM. Theoretically, the OSHA regulations could be enforced with citizen's enforcement clauses. But in practice, this procedure would have to be applied to only a few rules at first. One reason is that in 35 years of inspecting college art and theater departments, film and TV locations and studios, I can honestly say I have never seen a completely compliant workplace. The art and entertainment businesses probably are not unique. OSHA regulations have been ignored for so long that it is my guess that noncompliance today is the norm. So business would come to a screeching halt if citizens could file suit over every violation.

Nevertheless, we should consider starting this kind of program slowly. The political party that always complains about new regulations would be philosophically inconsistent if they argued against this solution. After all, isn't this the party that wants to privatize everything? And doesn't this same party want to cut the budgets of government agencies and reduce the tax payer's burden? Well, here's a way to accomplish all three of these objectives and protect workers in the bargain.

Let's start giving back **power to the people!** There. I feel better now anyway.

PLASA TECHNICAL STANDARDS NOW AVAILABLE FOR FREE

SOURCE: www.plasa.org

PLASA is the major standards developer for the entertainment business, producing best practice guidance for use of theatrical fogs, rigging, lighting equipment and much, much more. Until now, these standards cost money. Now all PLASA Technical Standards are available for free download, thanks to their recent alliance with ProSight Specialty Insurance.

According to their press release: "PLASA partnered with ProSight because they share in PLASA's commitment to making sure that everyone who attends or works on an entertainment event, from a live show to a film shoot, goes home safely at the end of the day. This collaboration significantly impacts the industry by allowing those involved in the creation of entertainment events free access to standards that will make their lives safer and easier."

"ProSight, a global specialty insurance carrier in the film and live events industry, also recognizes the skill and professionalism associated with the Entertainment Technician Certification Program and therefore offers preferred rates on insurance solutions to companies who employ ETCP Certified Technicians. To learn more about how PLASA and ProSight are working together, visit plasa.prosightspecialty.com."

To immediately start downloading your free Technical Standards, visit tsp.plasa.org/freestandards.

COFFEE AROMA IS HAZARDOUS?

SOURCE: "Obliterative Bronchiolitis in Workers in a Coffee-Processing Facility--Texas 2008-2012," *Mortality & Morbidity Weekly Report*, CDC, 62(16):305-307, April 26, 2013.

http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6216a3.htm?s_cid=mm6216a3_e

Obliterative bronchiolitis, a rare, irreversible form of obstructive lung disease, has been identified in workers exposed to butter-flavoring chemicals (diacetyl and related chemicals) while working in the microwave-popcorn and flavoring-manufacturing industries. Experts at the time this disease was documented assumed that many other flavoring chemicals may do the same. But there were no studies to support this assumption.

Now a report from the Centers for Disease Control (CDC) describes two cases of obliterative bronchiolitis identified in workers employed in a small coffee-processing facility. Both patients' illness was misdiagnosed before they received a diagnosis of work-related obliterative bronchiolitis, a disease which had not been identified previously in the coffee-processing industry. These cases reinforce the need for surveillance of workers in all industries which use flavoring chemicals.

The CDC counsels health professionals to be suspicious whenever their patients are progressively short of breath and work in an industry where flavors are used. This very rare and serious disease is considered a marker disease for the hazardous flavoring chemicals. If obliterative bronchiolitis is suspected, immediate removal from further exposure is crucial to prevent further deterioration of lung function. Some workers in the popcorn-flavoring industry will need lung transplants to survive.

COMMENT: Aw, NO! Not coffee, too! But this study shows that both natural and synthetic fragrances and aromas should not be inhaled in excessive amounts. As I point out repeatedly to readers, humans were designed to breathe air. Anything other than air in quantity can be a hazard.

It also doesn't matter whether chemicals are synthetic or natural in origin. Perfumes cause symptoms in many people whether or not the fragrances in the products are natural or synthetic. The synthetic chemicals are hazardous not because they are manufactured, but because they are so closely related to the natural ones.

Aroma therapists: Take note.

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 Sollery; Staff: Kathy Frost, John Fairlie, OES.

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ACTS FACTS

THE MONTHLY NEWSLETTER FROM

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JUNE 2013

Vol. 27, No. 06

CPSIA LEAD BAN HAS HOLES IN IT

SOURCES: 78 FR 25256-25257, April 30, 2013, Docket CPSC-2013-0016 (more on request)

A fund-raising letter from a fine organization, the Center for Environmental Health, lists among their achievements, their work on lead in children's bibs, lunch boxes, jewelry and candy as being the impetus for the "first-ever federal law banning lead in all children's products."

CEH is referring to the 2008 passage of the Consumer Product Safety Improvement Act (CPSIA), in which there was a limit for lead in children's products of 0.01 percent or 100 parts per million (ppm) effective August 14, 2011. Sounds lovely and part of the credit surely belongs to CEH, but the devil is in the details.

The limit of 100 ppm is only required when it is "feasible." There also are exemptions when the lead metal part is not accessible because it is under a casing or coating of some kind, or manufacturers can request an exemption if the amount of exposure to the lead would not be significant. And one manufacturer is applying for one now.

BIC pen has requested an exemption for the nibs of the ball point pens they plan to sell to children. The April 30th Notice concerned BIC Children's Pens which are meant for children age 5 and up and designed to address the needs of children learning to write. The notice says that "The accessible portion of the nickel silver points assembly that BIC proposes to use in its BIC Children's Pen contains total lead of approximately 8720 ppm..."

Well, that seemed to me a long way away from the 100 ppm limit. So I read the whole notice. One paragraph was particularly disturbing:

Under section 101(b)(1)(B) of the CPSIA, there is no measurable adverse effect on public health or safety if the exception will result in no measurable increase in blood lead levels of a child. In November 2012, CPSC [Consumer Product Safety Commission] staff issued a report, which found that, for the purposes of evaluating children's products for an exception from the CPSIA lead limit, a product will have no measurable adverse effect on public health or safety if a potential exposure to lead from the product is estimated to result in an increase in a child's blood lead level of less than 0.8 µg/dL [micrograms per deciliter]. The level of exposure that would be associated with such an increase is approximately 2.2 ug per day. That report may be viewed at: <http://www.cpsc.gov/PageFiles/133902/lead101.pdf>.

It just doesn't seem to me that adding almost a full µg/dL of lead to a child's blood lead is "no measurable effect." And there are studies showing it is at these low levels that the steepest rate of IQ decline is seen.

Fortunately, this Federal Register notice came shortly before a holiday when Toxicologist Brian C. Lee from Good Afternoon Toxicology, Inc., was able to take 14 hours out of his usually busy schedule. He pulled together all of the Docket information (the submission of data and comments on this action) and wrote four pages of technical response. He covered the issues of the CPSCs no measurable effect level and pointed out some serious flaws and gaps in BIC's supporting data.

Brian also noted in an e-mail to me that a five-year-old has no need to learn to write with a pen. It is likely that this is a method of establishing brand loyalty by familiarity at an early age similar to the way Apple developed this loyalty by making special deals for computers in schools. Besides, Brian noted, a pencil is cheaper, doesn't contain leaded parts, and is probably more easily gripped.

I also wonder about the use of nickel in the pen tip alloy. Nickel is a sensitizer and carcinogen. And while BIC asserted in their submission that kids will not put it in their mouths, I am unconvinced.

Whether Brian's letter changes the outcome of this action, only time will tell. But the incident should remind us that getting a bill passed is just the first step. Monitoring the actions taken under these laws and plugging up the holes are left to "the people" to respond during the public comment periods. But who, among us folks, has the time to read every little notice? And who among us has the expertise to reply to these petitions for exemption?

The bottom line is while it may sound like a public comment period is fair and equitable, the fact is the expertise and the money to request an exemption, and to defend it, is predominantly on the side of industry. But even without prompting from the outside, we would like to trust that the agency enforcing and administering the law is still able to protect us. As we observe CPSC's upcoming actions and decisions we will discover if our trust is still valid or misplaced

RAKU ADDICTS: BEWARE! BAD GAS CYLINDERS ARE OUT THERE

SOURCES: http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Hazmat/Emergency_Recall_Order_The_Lite_Cylinder_Company_Inc.pdf & http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Hazmat/Lite_Cylinder_Company_Termination_Letter.pdf

'Tis the season to buy a 20 or 30 pound pot of propane, dust off the burners and the insulating refractory brick, and show folks at the art fair how raku is done. But this year, check that gas cylinder. A recall notice has been published:

On May 24, 2013, The Pipeline and Hazardous Materials Safety Administration issued Emergency Order Number 2013-002 mandating a recall of all cylinders manufactured by The Lite Cylinder Company, Inc. (Lite Cylinder), Franklin, Tennessee, and marked as authorized under DOT-SP 14562 (and DOT-SP-13957 as authorized therein), DOT-SP 13105; any cylinder requalified under H706, and any cylinders manufactured under M5729.

This order includes 100-pound tanks used by art welders and jewelers and BBQ grill propane and cylinders of 10-and 33-pound capacities. The action immediately orders the removal from service of more than 55,000 two-piece fully wrapped fiber composite cylinders. Check the numbers on your cylinders if they are of this type of composite.

SHEET METAL PLANT EXPLOSION TRIGGERED BY ALUMINUM

SOURCE:<http://abclocal.go.com/wls/story?section=news/local&id=9048672>, April 1, 2013 (Glendale Heights, Ill.)

Two people were hurt in an explosion at the Northstar Metal Products facility in Glendale Heights, Ill. Smoke was seen coming from inside the building, but no exterior damage was immediately apparent. An employee says it appeared aluminum dust in the company's grinding room may have ignited to trigger the explosion, but the exact cause is still under investigation.

COMMENT. Aluminum dusts and filings are repeatedly the cause of explosions and fires. The two recent fatal Apple factory explosions in China were an example. My concern is that so many college art programs involve casting and machining of aluminum sculptures.

INCOMPATIBLE ACTIVITIES: WELDING & WOODWORKING

Often I see wood working and welding being done in the same sculpture area or scene shop in violation of OSHA regulations. The rules prohibit placement of combustible materials such as wood dust within 35 feet of welding operations unless separated by a floor-to-ceiling wall. But it is not always easy to cite this rule. I thought a review might be in order. Here's the actual wording:

1910.252(a)(1)(iii) Restrictions. If the requirements stated in paragraphs(a)(1)(i) and (a)(1)(ii) of this section cannot be followed then welding and cutting shall not be performed.

1910.252(a)(2)(I) Combustible material. Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks which might drop through the floor. The same precautions shall be observed with regard to cracks or holes in walls, open doorways and open or broken windows.

1910.252(a)(2)(ii) Fire extinguishers. Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

1910.252(a)(2)(iii) Fire watch.

1910.252(a)(2)(iii)(A) Fire watchers shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

1910.252(a)(2)(iii)(A)(1) Appreciable combustible material, in building construction or contents, closer than 35 feet (10.7 m) to the point of operation.

1910.252(a)(2)(iii)(A)(2) Appreciable combustibles are more than 35 feet (10.7 m) away but are easily ignited by sparks.

1910.252(a)(2)(iii)(A)(3) Wall or floor openings within a 35-foot (10.7 m) radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

1910.252(a)(2)(iii)(A)(4) Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

Note that the prohibition is not stated in terms of planning a safe shop. What it says you can't weld if combustibles are nearer than 35 feet unless you have a firewatch. A firewatch is a person paid to be there throughout welding activities and who must remain a full half hour after welding ceases.

The general interpretation is that you can use a firewatch for an on-site welding job where combustibles are present after you have a hot work permit for the job. But a permanent shop must be set up so that combustibles are not present within 35 feet.

When ACTS is involved in the planning of a shop, either the 35 foot distance is achieved or a wall divides the two activities. The plastic welding curtains do not qualify as a wall since sparks can go over or under these. Floors must be of noncombustible material and no cracks or crevices can be present. Locations for fire extinguishers are established. Another separate room must be provided for painting and finishing since flammable storage cabinets must not be present in either the welding area or the woodshop.

HAZMAT TEAM CLEARS RED SMOKE-BELCHING CHEMICAL MIX

SOURCE: <http://www.baltimoresun.com/news/maryland/howard/columbia/ph-hazmat-team-clears-accidental-chemical-mix-in-columbia-20130522,0,6138930>.

A County Department of Fire and Rescue Services hazardous materials team cleared a potentially hazard chemical mixture from a Columbia, MD, Athletic Club. The accident was caused by a cleaning crew, according to a department spokesman. The cleaning crew accidentally mixed bromine pool chemicals and Simple Green®, an all-purpose cleaner. The spokesman said the mixture emitted a red smoke, which was inhaled by one of the cleaning employees. The employee was taken to Howard County General Hospital as a precaution, according to the spokesman.

COMMENT. I can only hope that certain theater special effects people don't read about the red smoke from this easily-obtained pair of chemicals. This was almost surely red-brown bromine gas liberated by the reaction. It is very toxic and irritating.

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50-100 FOOT FALLS KILL 2 THEATER WORKERS IN LAST 3 MONTHS

SOURCES: Dozens of news reports on the Cirque accident in Las Vegas; "Fall at San Antonio's At&t Center Kills Crew Member" *PLSN newsroom* (Projection, lights & Stageing News), by Frank Hammel, April 6, 2013; & www.osha.gov enforcement actions-AEG Live.

ACTS FACTS has covered a number of deaths from falls over the years, but two incidents that occurred in April and June of this year involved fall protection gear at great heights.

JUNE INCIDENT. According to *Stage Direction's* on line magazine:

On the evening of Saturday June 29, a *Cirque du Soleil* performer fell during the climactic scene of *Ka*. The performer, Sarah Guillot-Guyard, 31, was pronounced dead at 11:43 p.m. Saturday at University Medical Center. The accident occurred during the climactic battle scene, when the moving stage is rotated into a near vertical position, and acrobats rappel up and down the vertical stage in harnesses. The *Las Vegas Sun* reported that Guillot-Guyard was still in her harness as she fell. Performances of *Ka* have been canceled until further notice

Different reports in news services place the distance she fell somewhere between 50 to 90 feet. Some reports claim she was her still in harness. Others say she appeared to have slipped out of her harness. Still others quote witnesses saying that the wire snapped. OSHA is investigating and the actual circumstances should be determined in order to prevent future falls due to this cause.

According to Reporter Melissa Yang in the July 3, *Las Vegas Review Journal*, OSHA has inspected many Las Vegas venues including "Ka," at MGM, in February 2009; "Viva Elvis," at Aria theater, from 2009-2010; "CRISS ANGEL Believe," at Luxor Hotel and Casino, in 2010; and "Zumanity," at New York-New York, from 2010-2011. "CRISS ANGEL Believe" was inspected again in May and remains an open case.

The violations OSHA found included problems with "explosives and blasting agents," "emergency action plans" and "guarding flow and wall openings and holes." Of the closed Cirque cases from both scheduled and unscheduled inspections, "Ka" was the only show to have no violation listed.

This is the only death during a performance in Cirque's 29 year history. It is this editor's personal experience that Cirque provides more precautions and training than most companies. Yang reported in the *Las Vegas Review Journal* on July 3 that Cirque will reopen without the battle scene.

APRIL INCIDENT. Thomas Dean Williams, 44, died April 5 after falling between 70 and 100 feet, according to local news reports. Williams was working on the venue's concert lighting rig and fell to the stage, where others were working. The accident happened about 2 a.m. Friday after a Romeo Santos concert took place at the AT&T Center in San Antonio, Texas.

A spokesman for the County Sheriff's Office told local news media that Williams had been wearing a safety harness at the time, but he had temporarily disconnected it and was attempting to reconnect the harness when he slipped and fell from a center beam. Williams had been hired as a contract worker by *AEG Live Nation*, according to reports.

OTHER AEG CITATIONS. On October 25, 2011 at "America's Got Talent," a TV show filmed by AEG Live in Las Vegas, a stagehand fell 12 feet into a stage pit shattering his right leg and ankle. The State OSHA cited AEG under 1910.23(c)(1), fined them \$7,600 and reduced it to \$5,760.

Then on November 19, 2012, another AEG Live stagehand working the Shania Twain show at Caesar's Palace fell 30 feet, breaking his arm, herniating cervical discs, and causing brain swelling that affects vision in his right eye. OSHA has issued three citations. The one for 1910.12(c)(1) is listed as a repeat offense and a \$13,860 fine was proposed, plus two lesser fines for \$6930 and \$990.

Now with William's fall in April, that makes three deaths in three years. And AEG has another fine of \$42,000 from a September, 2011, inspection for fixed ladder and personal protection violations in a Kansas show. OSHA is investigating the Williams accident, but will AEG Live claim they are now not responsible because the worker was hired as an independent contractor? Stay tuned.

LIVE PERFORMANCE GUIDELINES FOR TEMPORARY STRUCTURES

SOURCE: Sellery Health + Safety, Inc.

Show business not only injures and kills its own workers and performers, it takes collateral damage: audience members can be killed and injured. Whether hundreds die in night club fires started by stage pyrotechnics, or seven die and dozens are injured when an outdoor stage in Indiana collapses, these deaths are all preventable. *ACTS FACTS* (March 2012) reported on the Indiana incident and noted that the guidelines for such structures were seriously flawed.

Another tragic stage collapse occurred on June 16, 2012 at Toronto's Downsview Park which caused the death of a drum technician. Although it was just one more in a long list of such accidents, this one occurred near the home base of Janet Sellery, a friend and colleague of mine. As she explained:

....I was reminded that Canada still had no official guideline to address the unique hazards relating to temporary structures used for performances and events. So I contacted the Ministry of Labour and offered to lead a working group to fix this. After a year of hard work with an amazing team, I'm thrilled to share this new Temporary Performance/Event Structures Guideline.

This and other guidelines are at <http://www.labour.gov.on.ca/english/hs/topics/performance.php>. They include:

- Risk Assessment for Productions Guideline
- Stage Combat/Stunts and Weaponry Guideline
- Scenery Guideline
- Mechanised Scenery and Automated Systems Guideline

Janet Sellery, CRSP, CHSC, can be contacted through Health & Safety Consultant, Sellery Health + Safety at www.selleryhealthandsafety.com.

2-COMPONENT URETHANE-ISOCYANATES ARE OSHA PRIORITY

SOURCE: OSHA Press Release: Trade News Release Banner Image: June 25, 2013, Contact: Office of Communications, Phone: 202-693-1999

WASHINGTON – The Occupational Safety and Health Administration today announced a new National Emphasis Program to protect workers from the serious health effects from occupational exposure to isocyanates. OSHA develops national emphasis programs to focus outreach efforts and inspections on specific hazards in an industry for a three-year period. ...

"Workers exposed to isocyanates can suffer debilitating health problems for months or even years after exposure," said Assistant Secretary of Labor for Occupational Safety and Health, Dr. David Michaels. "Through this program, OSHA will strengthen protections for workers exposed to isocyanates."

Isocyanates are chemicals that can cause occupational asthma, irritation of the skin, eyes, nose and throat, and cancer. Deaths have occurred due to both asthma and hypersensitivity pneumonitis from isocyanates exposure. Respiratory illnesses also can be caused by isocyanates exposure to the skin. Isocyanates are used in materials including paints, varnishes, auto body repair, and building insulation.

These paragraphs, quoted in part from OSHA's press release, are welcomed by ACTS. We urge all artists and teachers to discontinue use of these products. ACTS is aware of six art and theater workers who have developed illnesses from isocyanate-containing products.

Some of the trade names of products that should be avoided include Smooth-on®, Imron®, TAP Urethane®, PMC Urethane®, Art Molds Aqua Clear®, Clear Flex®, Crystal Clear®, Plasti-Paste®, EZ-Mix®, VytaFlex®, Econ®, Simpact®, Bondo urethane®, and EnvironMolds Mold-Quik®. Some of these companies also make products that are based on other plastics and do not contain isocyanates. The dangerous urethane products can be identified by three features: 1) they have a Part A and a Part B; 2) the word "urethane" is on the data sheet or label, and 3) a chemical whose name ends in "isocyanate" or "diisocyanate" usually is on the material safety data sheet.

Great Stuff® is an isocyanate product that does not appear have two components. The two parts actually mix in the pressurized can's long nozzle. A propmaker, who was using Great Stuff® to repair the Audrey man-eating plants for productions of Little Shop of Horrors, was awarded 100% disability for her isocyanate illness about 10 years ago. (I testified at the hearing.)

Some of the MSDSs and product labels will provide warnings about the dangers of the isocyanates. Others will not. Products without warnings may contain one of forty or more isocyanates for which no standards exist. This includes chemicals called "prepolymerized" isocyanates. These molecules all have the deadly isocyanate radical attached to them, but they have not been tested and proved toxic. The manufacturer is taking advantage of a flaw in the labeling law that allows untested chemicals to be considered "innocent until proven guilty." In 1994, the EPA stated clearly:

*...EPA believes that it is reasonable to anticipate that all members of the diisocyanate category will exhibit chronic pulmonary toxicity....**

* 59 FR 61454, Nov. 30, 1994, EPA: Addition of Certain Chemicals; Toxic Chemical Release Reporting: Community Right-to-Know; Final Rule.

There are other materials with which to make molds, to paint, and to construct. We don't need to risk our health, our careers and our lives by working with these materials.

LIQUID “N2” PARTY TRICK GOES WRONG: ONE MAN COMATOSE

SOURCES: <http://www.isciencetimes.com/art/services/print/php?articleid=5449>, Science Times: Latest News, by Philip Ross, 6/19/13; & <http://www.medicalgasconsultants.co.uk/2013/07/03/liquid-nitrogen-at-jagermeister-event-in-mexico/>; 7/3/13.

A promotional pool party for Jagermeister’s alcoholic beverages broke up in panic after liquid nitrogen (N₂) was poured into the pool. Video footage from the party, which took place in Leon, a city in the Mexican state of Guanajuato, shows men in orange jumpsuits adding four buckets of liquid nitrogen to a packed pool. A cloud of white, billowy mist soon completely obscured the people in the water. The video records people screaming and others passed out.

Nine people were taken to the hospital. Reportedly these people were diagnosed with cardiovascular damage but were released later. One man was taken to intensive care in a coma.

COMMENT. Any cryogenic (cold) gas, such as liquid nitrogen or carbon dioxide dry ice, can be a killer as soon as the amount of gas in the air reduces the percentage of oxygen in the air. The amount of oxygen in outdoor air ranges from 21 to 20.5 percent. Even at 19.5 percent, NIOSH says air-purifying respirators cannot be used and OSHA says there is damage:

Human beings must breathe oxygen ... to survive, and begin to suffer adverse health effects when the oxygen level of their breathing air drops below [19.5 percent oxygen]. Below 19.5 percent oxygen ..., air is considered oxygen-deficient. At concentrations of 16 to 19.5 percent, workers engaged in any form of exertion can rapidly become symptomatic as their tissues fail to obtain the oxygen necessary to function properly (Rom, W., Environmental and Occupational Medicine, 2nd ed.; Little, Brown; Boston, 1992). Increased breathing rates, accelerated heartbeat, and impaired thinking or coordination occur more quickly in an oxygen-deficient environment. Even a momentary loss of coordination may be devastating to a worker if it occurs while the worker is performing a potentially dangerous activity, such as climbing a ladder. Concentrations of 12 to 16 percent oxygen cause tachypnea (increased breathing rates), tachycardia (accelerated heartbeat), and impaired attention, thinking, and coordination..., even in people who are resting.

At oxygen levels of 10 to 14 percent, faulty judgment, intermittent respiration, and exhaustion can be expected even with minimal exertion.... Breathing air containing 6 to 10 percent oxygen results in nausea, vomiting, lethargic movements, and perhaps unconsciousness. Breathing air containing less than 6 percent oxygen produces convulsions, then apnea (cessation of breathing), followed by cardiac standstill. These symptoms occur immediately. Even if a worker survives the hypoxic insult, organs may show evidence of hypoxic damage, which may be irreversible...*

**Federal Register, Vol. 63, p. 1159.*

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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DIRECTOR & VIOLINIST DIE IN PIT FALLS 4 MONTHS APART

SOURCES: Olga Alexandrovna director dies after falling to the orchestra pit, Occupational Safety 17:18, Posted by JKAR, March 17, 2013, http://3.bp.blogspot.com/-DAWl6wX_63M/UYpslHi50wI/AAAAAAAAADg8/DoTtFZ6FPq8/s1600/olga-enns.jpg, & Bolshoi violinist dies in orchestra pit fall, BBC NEWS: Entertainment & Arts, 17 July 2013 Last updated at 12:34 ET, <http://www.bbc.co.uk/news/entertainment-arts-23348430>. Also Norman Lebrecht quotes Mathias Clason, April 5, 2013, http://regator.com/p/259907231/how_do_we_make_opera_stages_safe_places/...

On March 17, 2013, the Acting Chief Director of Opera and Ballet Tchaikovsky Perm (Urals, Russia) fell 3 meters [9.8 feet] into the open orchestra pit during a rehearsal of Peer Gynt. Olga Enns, 33, was admitted to intensive care in critical condition with head injuries. Olga spent two weeks in a coma, and died April 2, 2013. She had worked at the Perm theater since 2006. Preliminary versions indicate that the tragedy occurred due to violation of safety standards. Last summer the orchestra pit was rebuilt, widened and reportedly the pit cover was removed.

On July 17, 2013, a senior violinist at Russia's Bolshoi Theatre died after falling into the orchestra pit. Viktor Sedov, 65, a popular veteran of the opera house's orchestra for four decades, played in the second violins. The incident happened on Tuesday the 16th and Sedov died of his injuries in hospital on Wednesday. The exact circumstances of the incident remain unclear.

INTERNET COMMENT: Norman Lebrecht, author, broadcaster, and commentator, wrote the following after the Perm death.

The Swedish designer and director Mathias Clason is one of many readers who were touched by the death of Olga Enns from a fall off the stage at the Perm opera theatre. In Russia, there is little safety on stage and no compensation for accidents. The theatre volunteered to pay for Ms Enns's funeral and for the transportation of her remains to another town, where her sister lives. Mr. Clason was fortunate to survive a similar fall. Here is his report.

ALWAYS REMEMBER IN OPERA: THE GRAVE IS NEARBY

The tragic accident of the fallen director in Perm reminded me of the great director-designer Jean-Pierre Ponelle ending his career in an orchestra pit in Munich, 1988, at 56 - and when I, shortly after, almost did the same.

As an opera or musical designer many restrictions go with the set, risks, heights, railings for surfaces over six feet above stage etc. But the pit? That gigantic swimming-pool DOWN there, full of people, cellos, harps and drums. And above people fencing, dancing, dying- hopefully just pretending to... We build over it at times to create more floor space or hide a shrunken orchestra, we put nets over it so objects and leaves and Macbeth drinking cups should not fall into - but orchestras don't WANT to have cages and ceilings- they would go deaf.

Well, there I was in 1990. Ponelle just cold. Photo session dragged on, breaks, irritation- oh there's a nice picture! I happened to be on stage so I backed off with my camera, and I backed- and the floor was gone!

When I awoke - luckily the orchestra was on a stage circus balcony here but the wooden seats started two feet from the four foot high stage, and one of them was in my eye. With its corner. Commercial theatre. Blood. A lot! So I fell back on bulky lightning equipment. And passed out. And woke up. Indians! Twenty at least! Had I been captured? Was it some boy dream? Oh no...I had designed them myself for ANNIE GET YOUR GUN was to open in ten days. I was rushed to the hospital and the show went on. But folks, remember: Don't get TOO close to the audience. Mathias Clason, designer,director and librettist, Stockholm, Sweden - 04/5/13 10:17 AM

ACTS COMMENT: This should put to rest the myth that no one dies in these pit falls. All pits need temporary rails, pit covers, nets, barriers, or other precautions. To do otherwise is just so over.

OSHA CITES SCENERY COMPANY: FINES TOTAL \$49,600

SOURCE: US Dept Labor, Office of Public Affairs, Phila. PA, Release Number: 13-1492, "Jersey City, NJ, theatrical equipment company cited by U Department of Labor's OSHA for exposing workers to workplace safety and health hazards"

The U.S. Department of Labor's Occupational Safety and Health Administration (OSHA) cited Acadia Scenic Inc., Jersey City, NJ, a company which builds scenery for the entertainment industry for 22 violations and proposed penalties of \$49, 600. According to OSHA, the citations followed an April inspection which was prompted by the agency's Health-High-Hazard Top 50 Local Emphasis Program and its Amputations and Combustible Dust Emphasis Program. OSHA's release says:

The willful violations, with \$28,000 in penalties, were cited for a lack of guarding on hand-fed circular ripsaws and crosscut table saws. A willful violation is one committed with intentional, knowing or voluntary disregard for the law's requirements, or with plain indifference to worker safety and health. (Editor's underline.)

Most of the other citations were "serious" violations which OSHA defines as occurring "when there is a substantial probability that death or serious physical harm could result from a hazard about which the employer knew or should have known." Of 22 serious violations, 15 were for failure to:

- * keep the workplace clean and orderly;
- * prevent accumulations of explosive [wood] dust;
- * provide railings on stairs;
- * provide a written respiratory protection program for workers required to wear respirators;
- * have fire extinguishers mounted and readily accessible for use;
- * provide an educational program on the general principles of fire extinguisher use and hazards involved for workers expected to fight incipient stage fires;
- * provide machine guarding for a miter saw;
- * provide spreaders and nonkickback devices on two hand-fed circular ripsaws;
- * properly adjust a work rest on grinding machinery;
- * determine each employee's exposure to methylene chloride [solvent];
- * provide appropriate gloves and eyewash facilities for workers using methylene chloride-containing adhesives; and
- * develop and implement a written hazard communication program that includes training for workers exposed to hazardous chemicals.

COMMENT: All of these willful and serious violations are ones I routinely see on film and TV location shops, and many college art and theater shops. Go OSHA!

3D PRINTERS EMIT POTENTIALLY TOXIC NANOSIZE PARTICLES

SOURCES: "Ultrafine particle emissions from desktop 3D printers," Brent Stephens, Parham Azimi, Zeineb El Orcha, Tiffanie Ramos, *Atmospheric Environment* 79 (2013) 334-339; <http://phys.org/news/2013-07-3d-printers-shown-emit-potentially.html>; & "3D printers shown to emit potentially harmful nanosized particles," *Technology/Engineering*, July 24, 2013

THE PARTICLES. Ultrafine particles (or UFPs) are small, nanosized particles less than 100 nanometers in diameter. Human inhalation of UFPs may be important from a health perspective. UFPs deposit efficiently in both the pulmonary and alveolar regions of the lung, as well as in head airways. Deposition in head airways can also lead to translocation to the brain via the olfactory nerve. The high surface areas associated with UFPs also lead to high concentrations of other adsorbed or condensed compounds. Several recent epidemiological studies have also shown that elevated UFP number concentrations are associated with adverse health effects, including total and cardio-respiratory mortality, hospital admissions for stroke, and asthma symptoms.

THE STUDY. A study, reported in *Atmospheric Environment* in July showed that desktop 3D printers release ultrafine particles (or UFPs) when the printers were used to print small plastic figures during normal operation. The study calculated emission rate estimates ranging from about 20 billion particles per minute for a 3D printer utilizing a lower temperature polylactic acid (PLA) feedstock to about 200 billion particles per minute for the same type of 3D printer utilizing a higher temperature acrylonitrile butadiene styrene (ABS) feedstock.

The study considered data from other studies of UFPs from indoor activities, including cooking, grilling, burning scented candles, operating laser printers, and cigarette smoke. But the authors of the 3D printer study say, "it is not straightforward to compare our results directly to results from many of these studies because they have varied in both their minimum and maximum measured particle sizes, as well as in their definition of UFPs." However, one cooking study (Buonanno, G., Morawska, L., Stabile, L., 2009. Particle emission factors during cooking activities. *Atmospheric Environment* 43, 3235e3242.) was quite similar in protocol and the authors concluded that:

...our estimate of the total UFP emission rate for a single PLA-based 3D printer...was similar to that reported during cooking with an electric frying pan.... The same 3D printer utilizing a higher temperature ABS feedstock had an emission rate estimate similar to that reported during grilling food on gas or electric stoves at low power.... (underline added)

Another issue is that the study had no information about the chemical constituents of the UFPs emitted from either type of 3D printer. The authors acknowledge that condensation of toxic synthetic organic vapors from the thermoplastic feedstocks are likely a large contributor to the UFPs. Thermal decomposition from the ABS plastics are known to have toxic effects.

The authors conclude: "These results suggests caution should be used when operating some commercially available 3D printers in unvented or inadequately filtered indoor environments."

COMMENT: The authors of the study did not point out that stoves and grills have range hoods! 3D printers need local ventilation, too. They also did not mention the chemicals used to consolidate the 3D plastic powder forms. Some use highly toxic isocyanates. I often see other laser equipment such as computer routers which vaporize plastics or wood in 3D printer rooms. ACTS concludes that: **all 3D and laser equipment, their emissions, and the chemicals used in production and maintenance, must be evaluated in order to plan proper ventilation and precautions.**

UNUSUAL STUDY OF MURAL PAINTING RESTORERS AVAILABLE

SOURCE: "Health Effects of Exposure to Indoor Fungi: Case Study—the Restorers of Mural Paintings," Daniela Maxim, *European Journal of Science and Theology*, June 2013, Vol. 9, No. 3, 140-157

Twenty five Romanians who work in historic site buildings were given a health questionnaire which solicited information about mold exposure and physical symptoms. Sixteen of these workers were mural painting restorers.

While the translation to English is a little shaky in places and the sample size is small, nonetheless, it is probably the only study like this of this population. For those conservators who, like me, collect everything we can find in this sparsely studied area, you can try googling the paper listed under the title. If you don't find it, e-mail me and I'll attach a copy for you. Actsnycc@cs.com

CANADA ASSESSING 28 PHTHALATES

SOURCE: "Canada Assessing 28 Phthalates," *Chemical & Engineering News*, Vol 91, Issue 29, p. 21.

Canada is requiring makers and importers of 28 phthalates and several types of products containing phthalates to provide data on manufacturing, use, and unpublished toxicity information. The agency, Environment Canada, will use the data to assesses the phthalates as a chemical class to determine if they need to be regulated. All phthalates are thought to function in the body in a similar fashion.

This strategy "may lead to informed substitution and less duplication of effort and avoid repeated product formulation changes over time," Environment Canada said in a July 13 notice. The 28 phthalates are commonly used as plasticizers in adhesives, sealants, paints, and coatings, plastic and rubber materials, according to the agency. The reporting requirements apply to a host of products containing the phthalates, including items for children under age six, clothing, footwear, vinyl or laminate flooring, and packaging that has direct contact with cosmetic or personal care products.

COMMENT: Regulating chemicals by class based on information about only a few of the members is a far better approach than waiting in vain for industry to test them all. If industry disagrees, let them test them all and make their case with that data.

ACTSFACTS 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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September 2013

Vol. 27, No. 09

LASER PRINTER INK CONSERVATION ISSUE

SOURCE: Conservation DistList, consdistlist@cool.conservation-us.org, inquiry dated August 6 and posted August 8, 2013, subject: Inst. 27:8, permission to reprint by author, 8/11/13

I keep up on many art and theater fields by monitoring forums or lists where people talk to each other or ask questions. One of these is the Conservation DistList. It is dedicated to various museum conservation issues. An inquiry from Robyn Waymouth, Archivist at Royal Women's Hospital in Parkville, Australia on "Laser print damage to paper" caught my eye. She wrote:

I have just noticed in a correspondence file from 2000 that some of the pages, most probably printed by a laser printer, now have very distinct rust brown shadowing of the text on the back of the page--you could read it quite clearly (with a mirror). Given that this file, and possibly many others with the same problem, are designated for permanent retention under our Public Records Act, this is potentially a serious problem. I'm unable at this stage to identify the printer or the paper, but it only occurs on some discrete items in the file.

Has anyone come across this before? Any thoughts on what might happen to these pages in the long term?

I did have some thoughts on this and replied:

...that laser printers and inks have varied greatly over the years. Both the temperatures at which the inks are applied and their compositions vary.

Of course, my interest in this technology originally had nothing to do with the archival quality of the printed page. My interest was in the particulates, gases, and vapors that are emitted into the air by laser printers and their toxicity. The particulates [often] are in nanoparticle size which is likely to mean they are an even more serious hazard than larger particles of the same substances. Those of concern to you are the particulates that stay on the paper. They include carbon, iron oxides, titanium dioxide, cyan dyes, and more. Titanium dioxide is considered a lung carcinogen by our National Institute for Occupational Safety and Health and more recently has been listed by the International Agency for Research on Cancer (2B). Carbon nanoparticles appear to be able to penetrate the lung tissues (in the alveoli), enter the blood stream and serve as foci for clots which can cause strokes and heart problems. And most of the other nanoparticles have never even been studied for toxic effects. The lab rat for these tests can be seen in your mirror.

That paragraph above should give you a clue that the "rust brown shading" is probably just as you observed---rust! And the bleeding of the iron oxide color is probably not just due to solubilizing, but to migration of nanoparticles into the paper.

But this observation of yours is likely to be the first in a whole series of conservation issues.

From my perspective, the amounts of the toxic substances encountered by conservators of archived laser documents is likely to be either insignificant or easily controllable. But the issues of degradation of the images and treatment are going to be extremely difficult to solve since the colorants and binders in these inks are usually trade secrets. And they changed over time. Even if you knew the ingredients of the dozens of products in a given year, you probably wouldn't know which was used on a particular document. And so on.

I think we will all long for the days when a key struck a black or red inked ribbon at room temperature creating no airborne particulates whatever.

MANGANESE LIMITS DROP: WELDERS NEED VENTILATION

SOURCES: How Would Lower Limits for Manganese Affect Welding?, Paul Blomquist & Dan Chute, *Welding Journal*, August 2012, pp 42 -47 & TLVs and BEIs, *ACGIH*, 2013.

Exactly a year ago, ACTS FACTS covered a study showing that if the American Conference of Governmental Industrial Hygienists (ACGIH) adopted their new proposed workplace air quality limits for manganese (Mn), workers doing almost any form of welding would exceed them. Well, the proposed standard was adopted. Here's the old and new limits we must consider:

MANGANESE LIMITS	milligrams/cubic meter (mg/m³)	
OSHA permissible exposure limit - ceiling limit (PEL-C)*	total Mn	5.0
Old ACGIH threshold limit value - 8 hour limit (TLV-TWA)**	total fume	0.2
The two new ACGIH TLV-TWAs	inhalable***	0.1
	respirable***	0.02

* PEL-C = permissible exposure limit, instantaneous ceiling limit not to be exceeded.

** TLV-TWA = threshold limit value, 8-hr time-weighted average.

*** Inhalable particles have diameters in the range of 10-100 microns. Respirable particles are <10 microns.

HISTORY. The reason for the changes can be traced to studies of manganese exposure over time. Years ago it was established that a disabling disease call manganese Parkinsonism could be caused by exposure to airborne manganese. The disease was well-documented in manganese ore miners and other people exposed to large amounts of manganese dust. This included 1960s studies of Australian aboriginal artist-painters who used ground manganese dioxide ore as a pigment. The old workplace air quality standards were set to prevent this crippling form of manganism.

Mild steel is a type of carbon steel that contains manganese at a maximum of 1.65 percent. It was thought this percentage was too low to be a significant health issue for welders. But Parkinson's disease was found to be more prevalent in welders. Some researchers did not believe these cases were directly caused by manganese. The disease was given different names by various researchers. Lawsuits were filed on behalf of sick welders. Labor wanted action. And the welding industry demanded proof.

Studies to either prove or disprove the Parkinsons/manganese connection were devised. Some of these involved medical testing of healthy welders for early signs of the disease. These tests made it clear that many welders had significant neurological deficits. Further, the degree of impairment was proportional in severity to their estimated levels of exposure to manganese.

The deficits include slower visual reaction time, poorer hand-eye coordination, less control of fine hand and forearm movements, tremor and changes in short term memory. Ironically, these are physical attributes that welders need to do their work. Clearly, manganese was affecting welders and lower air quality limits were needed.

TYPES OF WELDING JOBS ASSESSED. To review the manganese exposure data reported last year, airborne manganese produced by different processes listed from the highest to the lowest are:

- 1) flux cored arc welding (extremely high!),
- 2) pulsed gas metal arc welding,
- 3) shielded metal arc welding (MIG),
- 4) carbon arc gouging gas tungsten arc welding,
- 5) handheld power tool surface grinding,
- 6) hybrid laser arc welding, and
- 7) gas tungsten welding (TIG)

Of these, only welders doing shielded TIG were exposed to levels below the new ACGIH respirable standard. The shocker in the study was that even plain handheld power grinding of mild steel exceeded the respirable standard. Power grinding of sculpture surfaces should be done in local exhaust such as on a slot hood vented welding bench.

WHAT TO DO. Since this is based on one study and TIG still exposed workers to manganese, only at levels a bit below the standard, it makes sense to do all types of welding in local exhaust ventilation. If flexible duct exhaust hoods are used, only the types that move easily from one position to another should be used. Schools must require students to take the time to move the flexible hoods close to the point of weld since they only collect well within a foot from the face of the hood. Welding outdoors also will not insure adequate reduction of exposure to manganese.

If respiratory protection is used, the school or shop should institute a full respiratory protection program, medical certification, fit testing and training. The type of respirator should be selected based on a risk assessment involving personal monitoring of the welders. There are special types of respiratory protection that will work under welding face shields.

EXPLOSIONS: THREE SHORT AUGUST NEWS ITEMS

MAN BURNED WHEN FUEL DRUM EXPLODES

SOURCE: <http://www.heraldsun.com.au/news/national/man-suffers-burns-to-30-per-cent-of-his-body-when-fuel-drum-explodes-at-priests-rd-deception-bay/story-fnii5v70-1226692194493>

On August 6th in a semi-rural area north of Brisbane, Australia, a 47 year-old man suffered burns to 30 percent of his body after an explosion. The man was taken to Royal Brisbane Hospital, was in stable condition and would be treated for burns to his arms, face, neck and chest. A spokesman for the Queensland Police Service said the man was using a grinder to cut the top off a 200 litre drum that previously stored fuel when it exploded.

CONSTRUCTION WELDER INJURED IN EXPLOSION

SOURCE: <http://www.fs-world.com/Show.asp?ID=13946&Form=1>

On August 7th in Springfield, Missouri, a 57 year-old welder at a local construction facility was injured when a diesel fuel tank exploded. The man was welding on a metal fuel tank that he believed to be empty and cleaned of fuel.

THREE WORKERS BURNED AT EXXON MOBIL SITE

SOURCE: <http://www.ktre.com/story/23110375/v>

On August 10th at an oil field near Dallas, Texas, three workers contracted by Exxon Mobil were injured in an explosion. The workers were 54, 26 and 25 years old. All three were transported to Parkland Hospital in Dallas. Two men were admitted for treatment of burns and blast injuries. The youngest man was treated and released. The explosion was apparently caused by welding on a pipe believed to be clear of hydrocarbons.

COMMENT: Explosions from welding or grinding on drums and pipes are common. Make certain there is not even a whiff, sheen or bit of solid residue left in any container before working on it.

INACCURATE FLASH POINT VALUES ON MSDSs

SOURCE: <http://oeh.tandfonline.com/doi/full/10.1080/15459624.2013.818233#.Ug0EQGTzav1>

In an article that has been accepted and which will be published soon by the *Journal of Occupational & Environmental Hygiene*, Diane Radnoff describes her study of 83 products sold in Canada for various industrial purposes. She measured each product's flash point using a standard method.

PRODUCT TYPES

- 2 Adhesives
- 19 Solvents
- 15 Cleaners/surfactants
- 7 Fracking fluids & related chemicals
- 4 Fiberglass/plastic related chemicals
- 7 Corrosion/scale inhibitor
- 4 Lubricants/hydraulic fluids
- 13 Coatings
- 7 Fuel additives
- 2 Insecticides
- 3 Other

The results of the study indicate there were significant variations between the disclosed and her measured flash points. More than a third of the products had flash points lower than the one disclosed on the MSDS. In some cases, the values were more than 20° lower than the disclosed values. This could cause workers to underestimate the flammability hazard of the products they use.

It is clear from the categories of products tested that some are materials that are also used by art and theater workers, students and teachers. Two such products highlighted in the study as worst-case examples were common art and scenic art materials. These were:

- A water-based latex primer and finisher had a measured flash point of 84.5°C and should have been classified as a combustible liquid. [The MSDS said "none" under flash point.]
- An epoxy laminating resin had a measured flash point of 39.5°C while the disclosed [MSDS] flashpoint was <150°C.

RATING SYSTEMS. The article also goes into detail about the new Globally Harmonized System of flammability ratings to show how seriously confusing these errors in flashpoint will be. In some cases they will cause the products to be listed in the wrong categories on labels and Safety Data Sheets, leading to further misunderstanding in users of the products.

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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RICH & POOR FOLKS' BODIES HARBOR DIFFERENT TOXICANTS

SOURCE: Prepublication article accepted by Environment International (Journal). Associations between socioeconomic status and environmental toxicant concentrations in adults in the USA: NHANES 2001-2010. Tyrrell J, Melzer D, Henley W, Galloway TS, Osborne NJ. Environ Int. 2013 Jul 23;59C:328-335. doi: 10.1016/j.envint.2013.06.017.

A team of researchers from the European Centre for Environment and Human Health at the University of Exeter Medical School in the United Kingdom, used 10 years' worth of blood and urine data collected by the Centers for Disease Control and Prevention in the United States to investigate the association between 179 of the toxic substances being monitored and the subjects' socioeconomic status (SES). Initially, the Exeter researchers thought the data would demonstrate that low-income individuals have more toxic chemicals in their bodies than the rich. Instead, the team found certain toxicants that are more common among wealthy individuals as well as an equal number of toxicants that are more common among those who are poorer.

The chemicals harbored at high levels by the rich included mercury, arsenic, caesium, thallium, perfluorooctanoic acid, perfluorononanoic acid, mono(carboxyooctyl) phthalate and benzophenone-3. The mercury and arsenic are attributed by the team to higher levels of seafood consumption among the wealthy. Sunscreen use was an important mediator in the benzophenone-3 levels.

Those chemicals at especially high levels in the poor are lead, cadmium, antimony, bisphenol A and three phthalates (mono-benzyl, mono-isobutyl, mono-n-butyl). The higher levels of cadmium and lead were partially mediated by smoking, occupation in heavy industry, and diet.

COMMENT: I found interesting the difference in phthalates, perfluorocarbons and bisphenol A. This can only mean that the toys, cars and tools of the rich are made from different plastics and those of the poor. Those phthalates elevated in the poor are more likely to be found in inexpensive vinyl plastics. But in either case, both high end and cheap plastics are leaving their additives behind.

It is comforting to know that a sort of equality exists. And it looks like a strategy of avoiding seafood, sunscreens, smoking, hard industrial work and plastics would just about do it.

SERIOUS CHEMICAL ACCIDENTS: NO ACCURATE RECORDS EXIST

<http://www.allgov.com/news/top-stories/no-accurate-records-kept-of-serious-chemical-accidents-in-us-130829?news=850985>

After the fertilizer explosion in West, Texas, the *Dallas Morning News* wanted some statistics on the number of serious chemical accidents in the United States. They went through thousands of federal records to learn that no single agency in the federal government keeps track of such disasters. The reporters said, "In fact, no one at any level of government knows how often serious chemical accidents occur each year in the United States. And there is no plan in place for federal agencies to gather more accurate information."

This information was picked up by a blog at www.allgov.com which claims to report “Everything our government really does.” This blog primarily criticizes government, but if they read their own copy, they would see that this is not the government’s fault. No agency had either the funds or the authorization to do this. And industry is busy hiding their accident facts and figures.

For example, in 1985, the Environmental Protection Agency attempted to establish this kind of database, but within four years it lost its funding (an outcome that could be expected in the Reagan Administration). In addition, the National Toxic Substances Incident Program tries to gather data from some state and local agencies, but it lacks funding to establish an inclusive national resource.

One federal agency, the U.S. Coast Guard’s National Response Center (NRC), says it gathers comprehensive information on chemical accidents in the U.S. But the Dallas newspaper found out that the NRC is only a call log like a 911 hotline. Those first reports often turn out to be wrong.

The researchers also found that a self-reporting program sponsored by the chemical industry was set up by 100 members of the American Chemistry Council. But it lacks credibility because many companies refuse to release their accident data. And in general, industries actively resist accident investigations. Both British Petroleum and West Fertilizer tried to block the Chemical Safety Board from investigating these accidents and making their results public.

COMMENT. I could have saved those researchers a lot of time since it is common knowledge in my field that no one keeps these records. That is one reason these accidents will continue to happen. We can’t fix problems that are not defined or acknowledged. As it stands, industry remains free to put our communities and the environment at risk. And people will continue to blame some vague entity they call “government” when it actually is lack of funding and policies from Washington politicians that render those agencies that could collect and compile this data unable to do so.

This lack of records also affects the theater and entertainment industries. Except for the spectacular nightclub fires, there is no record of the many deaths and accidents in theaters and arenas. This makes it almost impossible to make the case that our safety standards should be improved. For example, it is the National Fire Protection Association’s policy not to change any standard for which there is no proof that the changes would prevent accidents. So theater designers can expect that the NFPA 101 codes for theater facilities will not address fall hazards at the front lip of the stage or the 26 inch balcony rail that their codes currently permit. I suggest designers, instead, consider that: 1) any rail below people’s center of gravity creates the a potential for falls; and 2) OSHA will cite employers who put workers next to fall hazards protected by rails that are less than 42 inches high.

MET MUSEUM: WAS RECENT EXHIBIT A FIRE HAZARD?

I’ve been concerned for some time about art exhibits in museums and galleries. Often the materials from which large installations are made appear to me not to be fire resistant. But clearly, I cannot chop off a piece to do a field flame test, so I was limited to mere suspicions. And I really hoped that curators were aware of building fire laws and were filing fire certificates on their installations.

So imagine my surprise at receiving the following note from Timothy H. Buchman, a retired member of the International Alliance of Theatrical Stage Employees. Tim has decades of professional theatrical experience. He also operated scene shops in college such as Amherst and Emerson, and at the Cleveland Ballet, and was the Head Carpenter in Martha Graham’s touring company. He knows well building codes, fire regulations, and how to do the field flame test.

Dear Monona,

After some summer visits to the Met Museum, I felt concern about two galleries in the less-than-successful Alexander McQueen show, “Punk” fashion exhibition. (The show closed in August without incident.) Although I immediately wondered about the shiny vacuformed walls in “D.I.Y. Bricolage”, I worried most about the white beadboard walls and elaborate molding-trim of the “D.I.Y. Hardware”. Every inch of the walls of this high-ceilinged gallery were covered with what looked like styrene foam. And it was unpainted.

Contrary to normal museum practices (!) they must have hoped that people would scratch “Punk”-y graffiti in the walls, because that's what happened. I never touch anything in a museum, including exhibits marked “Please Touch”. So it was not until a third visit that I was able to pick up some scraps of the exhibit, that had fallen onto the floor. When I applied a wooden match to these scraps and removed the ignition source, they continued to burn until completely consumed, emitting greasy black smoke and dripping hot globs. I also was unable to discern any sprinkler heads, bare or drop-off covered, or any fire extinguishers nearby.

Perhaps that's not a surprise in a museum of irreplaceable objects. But it makes you think about what they put into it!

Although two recent tragic nightclub fires (Connecticut and Brazil) involved exposed resilient, not rigid foam, and a different polymer, I would think that the danger I'm describing should have triggered some analysis and changes in design. For example, I understand that since I last built with it, beadboard is now available in an inherently fire-resistant formulation.

I wrote to the Director of the museum over a month ago, so he'd have time to cut some samples at the load-out of the show. But I haven't heard a peep back.

Regards, Tim

COMMENT: Well! Have any readers been to this exhibit? Is anyone from the Met listening? I certainly think they owe Tim a reply to his letter. We're taking comments.

CDC INVESTIGATES NIGHT CLUB FOAM PARTY INCIDENT

SOURCE: Notes from the Field: Eye Injuries Sustained at a Foam Party—Collier County, Florida 2012. CDC, *Morbidity and Mortality Weekly Report (MMWR)*, August 23, 2013 / 62(33);667-668

On May 26, 2012, the Collier County Health Department was notified by law enforcement and hospital personnel that approximately 40 persons had sought care at local emergency departments because of severe eye irritation and pain. Patients reported that they had attended a foam party at a local nightclub in Naples, Florida. Foam parties are events at which a soapy foam is sprayed onto the dance floor while participants dance. The foam is distributed from blowers on the ground or attached to the ceiling. Several feet of foam can be generated.

After 30 patients visited an emergency department in Collier County on May 26 complaining of eye injuries related to this party, an investigation was initiated by the Florida Department of Health. Interviews, contacts provided by local law offices and additional medical record abstractions from ophthalmology clinics, urgent-care centers and neighboring county hospitals led to the identification of an additional 26 cases. A total of 56 persons were identified during the investigation out of approximately 350 persons thought to have attended the party. This means, an estimated 16% of attendees suffered eye injuries as a result of this event, and 43 (76.8%) of them received medical

care. In all cases, injured persons reported getting foam in their face. Almost 90% of interviewed persons reported rubbing their eyes after exposure to the foam.

MEDICAL DIAGNOSES

Eye irritation (94.6%)
Severe eye pain (91.1%)
Pink eye/redness (87.5%)
Decreased visual acuity (81.3%)
Conjunctivitis (76.8%)
Abrasions of the cornea (50%)

Among those persons who sought medical care, the average number of medical visits was 3.2. The visual acuity of 11 patients could not be tested in at least one eye during their initial visit because they were unable to open the eye or read the first letter of the chart. Of those persons interviewed, the average duration of symptoms was 7 days. Seven of the patients still had symptoms more than 1 month after the party.

Other symptoms recorded included photophobia (71.4), eye drainage (57.1), skin irritation and rash (25.0), slips and falls (5.4) and allergic reaction (3.6). Obviously, not a good night out for many.

COMMENT: The investigators in Florida found that some of the foam products contain ingredients similar to those in soaps and shampoos such as sodium lauryl sulfate while other are proprietary and their chemical ingredients and concentrations are unknown.

The same basic detergent formulas are used in a solid form for artificial snow. This product is even used in Christmas shows where children compose the majority of the audience members. While the amounts of detergent released per person is much less, the snow is a dry form. A direct contact with the eye probably can cause symptoms. And dousing an audience of children with something that this study showed caused allergy in a few party goers is just plain a bad idea.

POTATOES KILL FAMILY

Hazardous Materials Managers News, <http://t.co/LIJxXKTD7> #HazMat, September, 2013

On September 7, 2013, a Russian girl was orphaned after her entire family died due to deadly gas caused by rotting potatoes in the cellar. Maria Chelysheva lost her mother, father, brother and grandmother after they each entered the cellar where they stored spuds for the winter and were overcome by the toxic fumes, police said.

COMMENT. This item and picture of the orphan from a Russian newspaper was in the *Hazardous Materials Managers News* website. Rotting organic material creates gases such as methane, carbon dioxide and hydrogen sulfide. Indoors, replacement of oxygen from any source can be hazardous.

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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ACTS FACTS

THE MONTHLY NEWSLETTER FROM

ARTS, CRAFTS AND THEATER SAFETY (ACTS)

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NEVADA OSHA PROPOSES >\$25,000 IN FINES FOR KA ACCIDENT

SOURCES: "Cirque du Soleil, MGM Grand cited in KA performer's death," Krista Hostetler, Las Vegas, NV (KTNV), Oct. 29, 2013 & Las Vegas, NV (KTNV) "OSHA Issues Fines for Death of Cirque du Soleil Performer," Jacob Coakley, *Stage Directions*, October 29, 2013, <http://ow.ly/sBa1UY>

The Internet is full of reports of the more than \$25,000 in fines proposed by the Nevada OSHA after the death of an acrobat at Cirque du Soleil's *Ka* last July. But most of the articles are general and not helpful. A search of OSHA's website only shows years-old citations for Cirque. But one reporter, Krista Hostetler of station KTNV in Las Vegas, provided the investigation's determination of the cause of the accident and the OSHA citations by number. Kudos also to Jacob Coakley of *Stage Directions* magazine for alerting the theatrical community to this informative report.

WHAT HAPPENED? The wire rope on which acrobat Sarah Guillot-Guyard was suspended was severed due to the rapid ascent of the performer causing the rope to be freed from the pulley and scrapping against a shear point. The OSHA report also indicates that the performer hit the metal grid over the stage as she ascended for the Final Battle scene. She fell 94 feet and was pronounced dead due to multiple blunt force traumas.

WHAT CITATIONS WERE ISSUED? OSHA officials cited Cirque du Soleil with six proposed citations and the MGM Grand Hotel and Casino that owns the theater with three citations. The fines total more than \$25,000 with three of the fines carrying a \$7,000 price tag. Cirque du Soleil and MGM are appealing the fines.

The individual citations as provided by KTNV are in italic below followed by ACTS' comments. First are the 6 Cirque violations followed by those against MGM.

1. - *NRS 618.375 (1): A General Duty Citation was issued because the employer did not protect or prevent KA employees from striking an overhead grid during the KA show at the KA Theater. \$7,000 proposed penalty.* COMMENT: We think that installing a mechanism to limit the height to which the performer could be raised should be possible and it would prevent this from being possible.

2a. - *The first part of the [2nd] General Duty Citation was issued because the employer did not provide proper training for the KA Battle Spearman Warrior employee involved in the accident in the use of equipment and tasks used in the Ka show, battle scene at the KA Theater.* COMMENT: If there is no fail-safe on the system, operators must be trained to prevent raising people too high.

2b. - *The second part was issued because the employer had a Fall Protection Program with construction requirements that do not apply to theater settings because the KA Theater is regulated by Nevada OSHA general industry standards. \$7,000 proposed penalty.* COMMENT. Theater people MUST be trained to understand both the Construction and the General Industry standards. The Construction standard apply during installing, building of sets and rigging. Once the performers are on stage, the General Industry Standards apply. Acrobats are not Construction workers.

3. - 29 CFR 1910.132: *This citation was issued because the employer did not properly assess the workplace for hazards that required personal protective equipment at the KA Theater, including opensided floors, bloodborne pathogens and other potentially infectious materials, pyrotechnic dust cleanup, and not finalizing a hazard assessment for the performers. \$7,000 proposed penalty.* COMMENT: Risk assessments are required for ALL workplace hazards. Theater companies must look at all potential hazards and foreseeable accidents and set up programs to address them. I am especially gratified to see that the Nevada OSHA inspection was complete enough to identify these additional issues. And the pyrotechnic dust clean up issue is one great interest to ACTS.

4. - 29 CFR 1910.132: *This citation was issued because the employer did not certify that a workplace hazard assessment had been performed and did not include the date the hazard assessments were conducted. \$0 proposed penalty, grouped with the proposed citation above.* COMMENT: The risk assessment is a formal approach that should be written, dated, and provided to affected employers so they will understand the procedures to mitigate the hazards.

5. 29 CFR 1904.32: *This citation was issued because the employer did not include on the OSHA Form 300 Log of Injury and Illnesses, the object or substance that directly injured or made a person ill, which prevented a trend analysis and kept the employer from recognizing and conducting employee training involving recurring injuries in accordance with Nevada Revised Statute. \$3,300 proposed penalty.* COMMENT: All employers must keep this formal log of their illnesses and injuries with dates and descriptions of events. Without this record, companies cannot see repeated problems that would alert them to the need for retraining and addressing the issues.

6. Nevada Revised Statute 618.379: *This citation was issued because the employer removed equipment from a fatality site on June 29 before Nevada OSHA authorized the dismantling and removal of the equipment (38 feet of wire rope that was attached to the victim at the time of the accident). \$935 proposed penalty.* COMMENT: All employers need to know that after an accident, the stage is a potential crime scene. Evidence must not be removed by employers or workers.

CITATIONS OF THE MGM GRAND HOTEL & CASINO:

1.- NRS 618.375: *This General Duty Citation was issued because MGM Grand employees were exposed to hazards due to deficiencies in the Cirque du Soleil Fall Protection Program with construction requirements that do not apply to theater settings because the KA Theater is regulated by Nevada OSHA general industry standards.* COMMENT: This is the same citation as Number 2b above, except that it is against the MGM Grand for not verifying that Cirque was properly protecting their employees. Employers cannot simply assume that another company is providing protection.

2. - 29 CFR 1910.132: *This citation was issued because MGM Grand employees were exposed to hazards due to the deficiencies in Cirque du Soleil hazard assessments for the KA Theater that included opensided floors, bloodborne pathogens and other potentially infectious materials and pyrotechnic dust cleanup. \$7,000 proposed penalty.* COMMENT: This is the same issue as Cirque's third citation. MGM cannot assume that their employees are protected. They must inspect and know.

3. - 29 CFR 1910.132: *This citation was issued because MGM Grand employees were exposed to hazards due to deficiencies in the Cirque du Soleil hazard assessments because Cirque du Soleil did not certify that a workplace hazard assessment had been performed and did not include the date the hazard assessments were conducted. \$0 proposed penalty, grouped with the proposed citation above.* COMMENT: this is the same issue as Cirque's fourth citation above. It faults MGM for not checking to see whether or not the required risk assessment had been conducted.

NEW STRATEGY ON AIR QUALITY STANDARDS (PELs) UPDATE

The Occupational Safety and Health Administration (OSHA) permissible exposure limits (PELs) are sadly out-of-date. Most PELs have been unchanged since 1971. OSHA tried to update them in 1989, but a court challenge by a coalition of industries vacated them in 1992. The court ruled that each PEL would require OSHA to develop complete economic and environmental statement first. Since the time to do this paperwork for all 400 PELs that needed updating would be many years, OSHA is unable to proceed. And today, there are many more substances that should be regulated for which OSHA has no standards at all.

But how many workers know they are not being protected? And how many employers know they are not protecting their workers by following these OSHA standards? OSHA has come up with a strategy to inform them. They have released two new Web-based resources: a step-by-step toolkit including information, methods, and guidance on chemical substitution in the workplace, and an annotated occupational exposure limits (OELs) table that features OSHA's existing regulations called the Z-Tables alongside other occupational exposure standards including the California OSHA PELs, the National Institute for Occupational Safety and Health's Recommended Exposure Limits (RELs), and the current American Conference of Governmental Industrial Hygienist's TLV@s.

ACTS is pleased to see this annotated table. It documents that the OSHA standards are generally far less protective than the standards from other respected health organizations. Until now, the ACGIH TLV@s were only available in a booklet that cost \$49.95 plus shipping. Now this data can be seen free at: <https://www.osha.gov/dsg/annotated-pels/index.html>

And since the regulatory route to updating the PELs is blocked by a court action, ACTS hopes people seeing this problem in black and white will demand legislative action.

WHISTLEBLOWER WINS CASE AGAINST A FLORIDA ART SCHOOL

SOURCE: *Bradenton Herald*, Bradenton.com, by Erica Earl

<http://www.bradenton.com/2013/10/22/4786375/whistle-blower-wins-case-against.html#storylink=cpy>

The U.S. District Court in Tampa awarded a former Manatee School for the Arts employee \$175,000 in back wages and punitive damages in a whistleblower lawsuit that OSHA brought in 2012. OSHA claimed that David Shack, a stage craft assistant employee, warned the school about electrical safety violations in the school's theater and was then wrongfully terminated in retaliation.

Shack, hired as a stage craft assistant in 2007 making \$15 per hour, had addressed potential fire hazards in the school's theater. His primary concern was improper placement of extension cords above the theater sprinkler system. When the school did not respond to a letter of concern Shack sent in June 2009, he filed a complaint with the Manatee County School Board. Then in July, 2009 he send a letter to OSHA. He was terminated July 30, 2009.

On Aug. 4, 2009, OSHA performed a safety inspection and cited the same electrical safety issues the employee noted. The Manatee School for the Arts entered into a settlement agreement with OSHA for \$2,000, records show. After he was fired, Shack said, he "let the complaint take its course." OSHA filed suit and the jury found the school and the Principal violated Section 11 (c) of the Occupational Safety and Health Act's whistleblower provisions. The jury also found the Principal and the school acted in "reckless indifference" to the rules.

The jury awarded Shack \$55,000 in back wages and \$120,000 in punitive damages: \$20,000 from the school; and **\$100,000 from Principal C.W. "Bill" Jones!** Shack said the settlement was "fair and reasonable," and, "It has been a rough four years." (COMMENT: Principals: listen up!)

NEW & PLANNED HEALTH STUDIES OF FIREFIGHTERS

SOURCES: "Mortality and cancer incidence in a pooled cohort of US firefighters from San Francisco, Chicago and Philadelphia (1950–2009)," Robert D Daniels, et al., *Occup. Envir. Med.*, Oct. 14, 2013.

<http://oem.bmj.com/content/early/2013/10/14/oemed-2013-101662>; "Study to track firefighter exposure to chemicals," by Paul Koenig, *Kennebec Journal* October 7, 2013 & "Blue Hill researcher to begin 15-year study of cancer risk in Maine firefighters," by Tom Walsh, *Bangor Maine News*, October 3, 2013

An important study, just published in the peer-reviewed journal, *Occupational and Environmental Medicine*, analyzed cancers and cancer deaths through 2009 among 29,993 firefighters from the Chicago, Philadelphia and San Francisco fire departments who were employed since 1950. The study was led by the National Institute for Occupational Safety and Health in collaboration with the National Cancer Institute and the Department of Public Health Sciences at the University of California at Davis. The study was supported in part by funding from the U.S. Fire Administration.

Cancers of the respiratory, digestive and urinary systems accounted mostly for the higher rates of cancer seen in the study population. But the firefighters also had a rate of mesothelioma two times greater than the rate in the U.S. population as a whole. This was the first study ever to identify an excess of mesothelioma in U.S. firefighters. Researchers said it was likely that the findings were associated with exposure to asbestos, a known cause of mesothelioma.

The other increased cancer rates found are consistent with the findings of another recently published study of firefighters in California by Dr. Susan Shaw, president and founder of the Blue Hill-based Marine Environmental Research Institute. Dr. Shaw found higher levels of chemicals from commercial flame retardants and other household materials than expected. Now Dr. Shaw announced that she is about to embark on a 15-year study which will analyze the blood of 50 Maine firefighters over five-year intervals for levels of polybrominated diphenyl ethers, or PBDEs. Shaw's earlier pilot study found these potentially cancer-causing chemicals were three times higher in the firefighters than the levels found in the general U.S. population.

COMMENT. Susan Shaw is a long-time friend of ACTS and she was a Board Member for many years before her work at the institute became too demanding. We are so proud and excited by her important study and will be following her progress in this newsletter.

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