

The Alternative

IRTA Newsletter

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n-Propyl Bromide Destroys Equipment in Dry Cleaning Plant

Stuart Pressman of Economy Cleaners in Sand City, California is a third generation dry cleaner who has worked in the industry for more than 40 years. Last June, he decided to use n-propyl bromide (nPB) in one of his two PERC machines. The supplier designated the cleaner as a California Beta Testing Site. The California Air Resources Board (CARB) adopted a regulation that will phase out the use of perchloroethylene (PERC) dry cleaning by 2023. To comply with this regulation, cleaners must convert to alternative processes. All of the alternatives to PERC require different equipment. To avoid making this purchase, Mr. Pressman decided to use n-propyl bromide. The supplier indicated that he could use it in his existing PERC machine.

Mr. Pressman used the nPB, which is sold under the tradename of DrySolv, for about six months and was pleased with its aggressive cleaning capability. Within about six months, in December, he began to notice a problem. On January 4, 2009, he asked for help from the suppliers of the solvent but the supplier put him off month after month and never actually visited the facility.

nPB must be used with stabilizers because the chemical is unstable when water is present. nPB reacts with the water to form hydrogen bromide, a very corrosive and toxic gas. The stabilizer takes up the water and prevents the nPB from "going acid." Several companies using the solvent have depleted their
(see **n-Propyl Bromide** page 6)

IRTA to Hold Laser Stripping Conference With Edison, Laser Strip and CARB

IRTA is planning a conference for interested potential users of a laser technology that can be used for stripping paint from various surfaces. The conference will be co-sponsored by Southern California Edison, Laser Strip, the company that owns the rights to a portable laser stripping prototype, and the California Air Resources Board (CARB). It will be held on October 21 at Edison's Customer Technology Applications Center (CTAC) in Irwindale, CA.

IRTA is conducting a project, sponsored by CARB, in partnership with Edison and Laser Strip, to test and demonstrate a small portable hand-held laser stripping prototype (see article in last issue of *The Alternative*). The partners have conducted four demonstrations of the

technology that is designed to substitute for methylene chloride and VOC chemical strippers and various media stripping systems like sand, plastic media or garnet blasting. The demonstrations involved stripping part of a water storage tank at the San Bernardino airport, stripping portions of aircraft parts, stripping portions of Navy ship parts and panels containing ship hull paint and stripping ground vehicles at the Barstow Marine Base.

IRTA is conducting cost analysis of the technologies used currently in the four stripping applications and is comparing the cost to the cost of using a laser stripping device for the stripping. Laser Strip is currently building a
(see **Laser Conference** page 5)



Small Business Corner

BAAQMD Considering Earlier Phaseout of PERC in Dry Cleaning

The Bay Area Air Quality Management District (BAAQMD) held a workshop on June 10 to discuss options for accelerating the phaseout of perchloroethylene (PERC) in dry cleaning. The California Air Resources Board (CARB) adopted a regulation on PERC dry cleaning that calls for a complete phaseout of PERC dry cleaning in 2023. The BAAQMD recently adopted a regulation, Regulation 11, Rule 16 "Perchloroethylene and Synthetic Solvent Dry Cleaning Operations," that implements the CARB regulation provisions in the Bay Area.

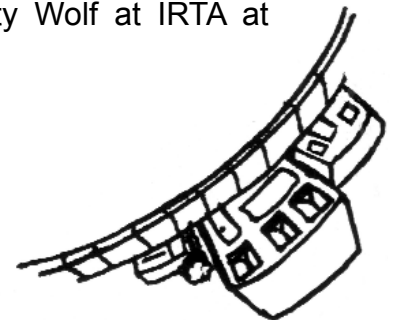
The current BAAQMD regulation requires cleaners to adopt alternatives to PERC when their machine is 15 years of age or older, beginning in July 2010. When the Bay Area Board adopted this regulation, the Board asked the staff to evaluate options to phase out PERC earlier. At the June 10 workshop, the staff presented three alternative options. Instead of waiting until the machine is 15 years old, the options would phase out PERC when the equipment is eight years old, 10 years old or 12 years old. These would lead to PERC phaseout dates of July 1, 2016, 2018 or 2020 respectively. The BAAQMD is planning to present the three options to their Board in the future and the regulation will be amended.

The South Coast Air Quality Management District (SCAQMD) adopted a regulation several years ago with a final phaseout date for PERC of December 31, 2020. The Bay Area proposed acceleration would phase out PERC at least six months sooner than the SCAQMD regulation, depending on which of the equipment ages is adopted.

The SCAQMD regulation is based on a different metric than the CARB and BAAQMD regulations. SCAQMD adopted a risk based method of determining when a cleaner must phase out their PERC equipment. SCAQMD has asked CARB to deem their regulation equivalent to the state regulation because of SCAQMD's earlier phaseout date of 2020. The District must obtain equivalency or they will have to modify their regulation. At this stage, since CARB has not ruled the SCAQMD regulation is equivalent, SCAQMD will likely have to modify their regulation to make it consistent with the state regulation.

The best thing for cleaners to do in any location is to convert to a non-PERC alternative. One alternative, n-propyl bromide (nPB), is not a good choice (see article in this issue of the newsletter) because of toxicity and technical problems in dry cleaning equipment. Another alternative, GreenEarth, has caused cancer in laboratory animals so it is not a good alternative either. For more information on the alternatives, access IRTA's website at www.irta.us. The website includes several reports on dry cleaning alternatives and spotting chemical alternatives.

For more information on the BAAQMD regulation, contact Marc Nash at (415) 749-4677. To discuss PERC dry cleaning and spotting chemical alternatives, contact Katy Wolf at IRTA at (818) 244-0300.



IRTA Investigates Dry Ice Blasting Technology for Cleaning Insulators

IRTA is conducting a project, sponsored by EPA Region IX, to identify, develop, test and demonstrate safer alternative methods for cleaning energized electrical equipment. For many years, companies used aerosol cleaners or larger bulk cleaners for this purpose. Many of these cleaners contribute to stratospheric ozone depletion and/or global warming. Supplies of one of these chemicals, HCFC141b, are almost depleted and utilities and industrial firms that have their own generating capability must find alternatives.

It is challenging to find suitable cleaning alternatives for energized equipment, which is equipment through which electricity is flowing. The alternatives must not be conductive and they must not have a flash point. One technology IRTA investigated for cleaning energized insulators is dry ice blasting. Insulators can

become very dirty and often they cannot be cleaned adequately with plain deionized water, another technology that can be used for cleaning energized equipment. The dry ice technology uses carbon dioxide pellets to blast the contamination from the surface of the insulators. The carbon dioxide sublimates or forms a gas and there is no residue from the operation apart from the dirt that has been removed from the insulators. A picture of a supplier demonstrating the use of the pellet blasting for cleaning an insulator is shown below.

The supplier has developed a portable system for cleaning contaminated surfaces. The user fills it with dry ice and directs the spray to the contaminated part with a wand. The system is compact and fits easily in the back of a pickup truck. The technology is also a good option for cleaning other surfaces where blasting with media of various types is currently used.

IRTA is also investigating corn cob blasting for cleaning insulators as part of the EPA project. The corn cobs are directed to the part with a wand and the corn cobs absorb the contamination.

IRTA is currently performing cost analysis of various methods of cleaning energized electrical equipment. The final project report should be completed in the next few months.

For more information on energized electrical equipment cleaning, contact Katy Wolf at IRTA at (818) 244-0300.



DTSC Begins Developing Green Chemistry Regulations

On September 29, 2008, Governor Schwarzenegger signed AB 1879 which is designed to implement a Green Chemistry Program and a related bill SB 509. AB 1879 establishes authority for Cal/EPA's Department of Toxic Substances Control (DTSC) to develop regulations that create a process for identifying and prioritizing chemicals of concern and to create methods for analyzing alternatives to existing hazardous chemicals. It allows DTSC to take various actions following an assessment that range from no action at all to restrictions or bans. AB 1879 also establishes a Green Ribbon Science Panel made up of experts to provide advice on scientific matters, chemical policy recommendations and implementation strategies. SB 509 requires that an online Toxics Information Clearinghouse be established to provide public access to information on the toxicity of chemicals.

DTSC convened the first meeting of the Green Ribbon Science Panel and has held several Green Chemistry regulations workshops throughout the state. Two workshops on safer alternatives regulations are planned for July or August in Los Angeles and Berkeley.

On April 21st, DTSC issued a Draft Straw Proposal which reflects the staff's thinking. It is intended to be a plain english outline of a "Safer Alternatives for Consumer Products" rule. DTSC is developing a "candidate" list of chemicals of concern. This list will be used and, based on criteria laid out in the regulation, a prioritized list of chemicals will be developed. An alternatives analysis will be required for consumer products that contain one or more high priority chemicals of concern. This analysis will be conducted by manufacturers, importers, suppliers or retailers and will be submitted to DTSC. The analysis will consider health impacts, ecological impacts and lifecycle impacts of the chemicals and the identified alternatives. At that stage, DTSC may require additional information, labeling, restrictions, prohibitions or engineered safety measures if the company decides to market the chemical in the consumer product.

Presently, it is not clear how DTSC is

defining consumer products. Some consumer products, like toys, more heavily expose children to possible harm. Other consumer products, like products used widely in industry and by consumers, expose thousands of people to potentially toxic ingredients.

IRTA has conducted projects in three major areas where consumer products are used. First, IRTA worked with the Hazard Evaluation System And Information Service (HESIS) and the California Air Resources Board (CARB) to find, develop, test and demonstrate alternative low-VOC, low toxicity alternatives to automotive aerosol cleaners. These cleaners are used by auto repair facilities and they are also used by consumers who purchase them in stores like Pep Boys. Solvents used in these cleaners included toluene, xylene, hexane and MEK, which are toxic. Alternatives that were demonstrated included water-based, soy based and acetone based cleaners that were much safer. CARB passed a regulation that reduced the use of VOC solvents by 10 tons per day in California. Suppliers are converting to low-VOC, safer alternatives.

Second, IRTA worked with DTSC on a project designed to develop, test and demonstrate alternatives to methylene chloride consumer product paint strippers. Methylene chloride is a carcinogen and paint strippers based on the chemical are sold in hardware and home improvement stores. The strippers are used by businesses and consumers. IRTA tested alternatives based on benzyl alcohol which is less toxic than methylene chloride. CARB is planning to develop a regulation on this category of consumer products.

Third, IRTA worked with DTSC on a project designed to develop, test and demonstrate safer, low-VOC alternatives to paint and lacquer thinner. These products contain various VOC and toxic solvents including toluene, xylene, mineral spirits and MEK and they are sold in hardware and home improvement stores. They are used by consumers, contractors and other businesses. The South Coast (see **Green Chemistry Regulations page 6**)

District Moves Forward with Regulation on Lubricants and Metal Working Fluids

On March 6, the South Coast Air Quality Management District (SCAQMD) adopted a new regulation that restricts the VOC limits of vanishing oils and rust inhibitors. Rule 1144 "Vanishing Oils and Rust Inhibitors," applies to industrial facilities which use vanishing oils and rust inhibitors that come into direct contact with products and parts during manufacture and assembly. It also affects suppliers of these materials.

The rule specifies that on January 1, 2010, the VOC content of vanishing oil must be 50 grams per liter or less. On that date, rust inhibitors must have a VOC content of 300 grams per liter or less. By January 1, 2012, rust inhibitors must have a much lower VOC content of 50 grams per liter or less. The rule also contains a prohibition of sale for these products. The vanishing oils and rust inhibitors regulated in the rule are essentially solvents with a very high VOC content. The provisions will phase out these high VOC solvents over the next few years. The test method used to determine the VOC content of these materials is EPA Test Method 24 which is appropriate for high VOC materials.

The District did not regulate the VOC content of direct contact lubricants or metal working fluids in the rule because some of these materials have a lower VOC content and/or are water-based. The District has historically used a test method called SCAQMD Method 313L, a method based on gas chromatography/flame ionization detection (GC/FID), which seeks to accommodate lower

vapor pressure and water containing products. This method has been used for several years in the Clean Air Solvent Certification Program at the District. The industry asked the District to consider other VOC content test methods and the District is currently working with the industry on this evaluation.

Over the next few months, the District and the industry plan to conduct Method 313L robustness testing with eight different laboratories. Round robin testing with several labs will be conducted for Method 313L after the robustness testing is completed. The workgroup will also conduct round robin testing of an alternative method called Thermogravimetric Analysis or TGA. All of the testing should be completed by August. In September, the District will report the results of the test method analysis to their Governing Board.

Once a test method or methods are accepted, the VOC content of several different types of products will be determined. This will allow the District to estimate the inventory emissions of direct contact lubricants and metal working fluids in the Basin. At that stage, the District plans to begin a rulemaking to cover the new categories and extend the prohibition of sale and labeling in Rule 1144 to the new product types.

For information on the regulation, call Mike Morris at SCAQMD at (909) 396-3282

Laser Conference

(Continued from front Page)

more powerful portable device and a much larger stationary stripping system. The results of the cost analysis and the new devices should be available for the conference. The small and more powerful portable devices will be on display for demonstrations at the conference.

Conference attendees will include government agency representatives and potential military and commercial users of the laser stripping device. Breakfast and lunch will be provided.

For more information or to make arrangements to attend the conference, contact Katy Wolf at IRTA at (818) 244-0300.

n-Propyl Bromide

(Continued from front Page)

stabilizer and the nPB has gone acid with very bad results. The dry cleaning process has a lot of water in it and, as IRTA has indicated in many earlier newsletter articles, it is very likely that any cleaner using the solvent in an existing PERC machine would see it go acid eventually.

The DrySolv in Mr. Pressman's machine went acid and a lab test verified it was nPB. It created a cloud of acid which was very corrosive. The acid ate a hole in his boiler, completely destroyed the PERC machine and also corroded a laundry dryer in the facility beyond repair. Much of the facility's pressing equip-



ment is rusted out. Mr. Pressman was present in the facility during the acid formation and may have impaired health as a result.

Mr. Pressman is very unhappy with the results of his conversion to nPB and would caution other cleaners about adopting the solvent. "No cleaner should use this solvent," says Mr. Pressman. Since the incident, Mr. Pressman has called other cleaners all over the country who are using the solvent. The other cleaners he has spoken to have experienced similar problems.

(see **n-Propyl Bromide** page 7)

Green Chemistry Regulations

(Continued from Page 4)

Air Quality Management District (SCAQMD) recently passed a regulation for these products that will reduce VOC emissions (and use) of these materials by almost 10 tons per day. CARB is developing a regulation scheduled for adoption in September for these products.

It is not clear how the DTSC green chemistry regulations will work. It is a poor choice to require the suppliers of prioritized chemicals to perform complex analyses of alternatives for or in the products they market. In the IRTA projects noted above, the suppliers

would not or could not identify lower VOC, low toxicity alternatives until after a regulation was adopted requiring them to find the alternatives. Before the regulation could be adopted, an independent organization, IRTA, developed and demonstrated alternatives. This helps the regulatory agencies see that alternatives are viable so the regulation can be adopted. It may be better for DTSC to rely on independent organizations to find and/or develop alternatives and perform the alternatives analysis in the green chemistry program.

For information on DTSC's Green Chemistry efforts, access DTSC's website at www.dtsc.ca.gov.

According to Mr. Pressman, "DrySolv is not a drop-in solvent. In any PERC machine, it is only a matter of time before the solvent causes a problem."

The supplier has so far refused to pay for the damage in the shop even though it is obvious the solvent caused the problem. It will be very costly for Mr. Pressman to replace the equipment and his health could suffer in the future.

Apart from being unstable in the presence of water, nPB is a reproductive toxin and it also causes nerve damage. It causes sterility in both male and female test animals and harms the developing fetus when tested in pregnant animals. It damages the nervous system and can cause weakness, pain, numbness and paralysis. nPB is listed on Proposition 65 but is not classified by CARB as a Toxic Air Contaminant or by EPA as a Hazardous Air Pollutant. Unless nPB is more heavily regulated, it is likely that other dry cleaners will convert to the solvent to avoid purchasing new equipment for use with the other alternatives. Next July, cleaners must start replacing their PERC machines as soon as they are 15 years old so it is a critical time to find a way to more stringently control the use of nPB.

In the last issue of this newsletter, IRTA included an article about Cal/OSHA's proposal to establish a Permissible Exposure Limit (PEL) for nPB in California. The proposed limit is 5 ppm. If



this limit is adopted, cleaners would not be able to meet it, even in secondary controlled PERC machines.

For more information on nPB, contact Katy Wolf at IRTA at (818) 244-0300. Mr.

Pressman is available to talk to dry cleaners using DrySolv about what to look for in the plant to determine if the solvent is causing problems. Please contact Stuart Pressman at (831) 394-3161.



"nPB causes health problems and it destroys all the equipment, but it cleans well!"

CALENDAR

July 15-18

AWFS Fair, Las Vegas Convention Center. For Information, access www.awfsfair.org

October 21

A Portable Hand-Held Laser Stripping Technology Conference, Southern California Edison's CTAC Facility, Irwindale, CA. For Information, call Katy Wolf at IRTA at 818-244-0300

September 21-27

Pollution Prevention Week 2009. Various state and local programs.

October 28-29

Western U.S. Sustainability & Pollution Prevention Conference, Bahia Resort Hotel, San Diego, CA. For information, access www.wsppn.org

IRTA is working together with industry and government towards a common goal -- implementing sensible environmental policies which allow businesses to remain competitive while protecting and improving our environment. IRTA depends on grants and donations from individuals, companies, organizations, and foundations to accomplish this goal. We appreciate your comments and contributions!

- Yes! I would like to support the efforts and goals of IRTA. Enclosed is my **tax-deductible** contribution of: \$ _____
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