

# The Alternative

IRTA Newsletter

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## Industry Supplied Mechanism for Siloxane Solvent Does Not Explain Rodent Tumors

The Office of Environmental Health Hazard Assessment (OEHHA) recently completed a review of the toxicity information on decamethylcyclopentasiloxane (D5). The chemical is a proposed substitute for perchloroethylene (PERC) in dry cleaning under the trade name Green Earth, and it is being used by many textile cleaners in California. It is used by industrial and auto repair facilities in parts cleaners used for repair and maintenance cleaning activities. It is also used in a variety of consumer products.

AB 998 established the Non-Toxic Dry Cleaning Program in California. The California Air Resources Board (CARB) is charged with implementing AB 998. Under AB 998, CARB provides

grants to dry cleaners for replacing a PERC machine with a non-toxic, non-smog forming alternative. CARB has determined that water-based and carbon dioxide processes meet the AB 998 grant requirements. The suppliers of Green Earth, the D5 dry cleaning solvent, have asked CARB to add their solvent to the list of non-toxic, non-smog forming alternatives so cleaners can receive grants for converting to the solvent. D5 has been deemed exempt from VOC regulations by EPA and by CARB, so the issue is whether the solvent can be considered non-toxic. CARB asked OEHHA to evaluate the available information on the toxicity of D5 to determine if it can be considered non-toxic.

(see *Rulemaking* page 3)

## SCAQMD Rule 1171 to Affect Printers in January District Adds Prohibition of Sale Provision

The South Coast Air Quality Management is amending Rule 1171. The rule, "Solvent Cleaning Operations," establishes the VOC content of a range of cleaning operations that are conducted in the South Coast Basin. The District is amending the rule to extend certain deadlines for cleanup materials for printing and to include a new provision that would affect suppliers of materials used in all cleaning applications covered by the rule.

The District first set a much lower VOC content limit of 100 grams per liter for cleanup materials used in screen and lithographic printing in 1999. The limit was scheduled to become effective in 2005. IRTA worked on technology development projects in each of the industries to try to identify, develop, test and demonstrate alternative low-VOC cleanup materials. The alternatives IRTA found that met the 100 gram per liter limit were water-

based cleaners, soy based cleaners and acetone cleaners.

At the request of the industries, the District established an interim VOC limit of 500 grams per liter. In July 2006, SCAQMD extended the VOC limit for the cleanup solvents to January 1, 2008. The District also increased the VOC limit for cleanup of UV/EB inks and lithographic presses with automated blanket and roller wash systems to 650 grams per liter. The exemption for cleaning metering or dampening rollers and plates in lithographic printing was also extended until December 31, 2007.

The lithographic printing industry, particularly the Printing Industries Association (PIA), in anticipation of the January 1, 2008 limit, conducted extensive testing with lithographic printing facilities.

(see *Rule 1171* page 6)



## Small Business Corner

# Tustin Cleaner Adopts Water-Based Cleaning Technologies

Legacy Cleaners opened in Tustin in early November, 2007. The cleaner is in a high end shopping center called Legacy District that opened recently. The shopping center is located at the site of what was formerly the El Toro Air Force Base and has a Target store as an anchor.

The cleaning facility is owned and operated by David and Jeeni Yoo. The couple is new to the textile cleaning business but they quickly learned the spotting, cleaning and finishing procedures. Says Mr. Yoo, "this is a very good location and our customer base is growing rapidly."

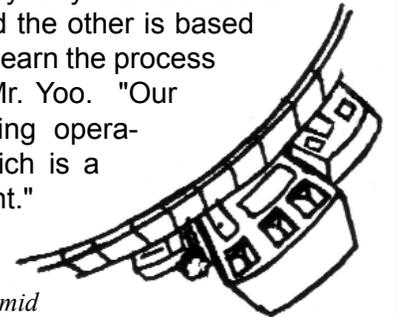
When the couple decided to lease the space, the landlord would not allow the use of any dry cleaning solvents. Mr. and Mrs. Yoo decided to use only water-based processes in the store. The shop has a Green Jet machine which uses a spray of water and detergent to clean garments. Many of the garments in the upscale area are not

heavily soiled so they are easily cleaned with this technology. Finishing with the Green Jet is simple; the garments are not immersed in water and are not wrinkled. The shop also has a wet cleaning machine which is used to clean the more heavily soiled garments. The combination of the Green Jet and wet cleaning equipment is ideal for Legacy Cleaners. "I like the water-based processes very much," says Mr. Yoo. "They are good for us and for the environment."

Mr. and Mrs. Yoo are using safe materials to perform their spotting. Two of the POG spotting agents they rely on are water-based materials and the other is based on soy. "We had to learn the process of spotting," says Mr. Yoo. "Our spotting and cleaning operations are green which is a good marketing point."



*Illustration by Todd Schmid*



## IRTA to Showcase Tustin Cleaner

Under AB 998, the California Air Resources Board (CARB) was given the authority to provide grants to cleaners in California for replacing a perchloroethylene (PERC) machine with non-toxic, non-smog forming alternatives. AB 998 also charges CARB with developing a demonstration program to make cleaners aware of certain eligible alternative technologies which include carbon dioxide cleaning and various water-based cleaning processes. CARB recently adopted a regulation that phases out PERC in California by 2023 and many cleaners will have to adopt alternatives over the next few years. The South Coast Air Quality Management District (SCAQMD) also adopted a regulation that phases out PERC earlier than the CARB regulation, in 2020. The SCAQMD regulation affects cleaners in Los Angeles, Orange, Riverside and San Bernardino, California. Cleaners in these counties account for about half the cleaners in the state.

IRTA received a grant from CARB to work with cleaners who have converted to carbon dioxide and water-based technologies to serve as

showcase facilities to feature the alternatives. IRTA is holding a showcase at Legacy Cleaners in Tustin which is located in Orange County. David and Jeeni Yoo, owners of Legacy, decided to use water-based cleaning technologies at their new facility which opened in November, 2007. The shop has a traditional wet cleaning machine and a Green Jet machine. Both types of equipment use detergent and water for cleaning garments. A case study for Legacy Cleaners is included in this issue of the newsletter.

IRTA and Legacy have scheduled the showcase at the Tustin store for Saturday, January 26, 2008 from 9:00 AM to 1:00 PM. The address of the cleaner is 2306 Park Ave., Tustin, CA 92780. Food and drink will be provided. Mr. and Mrs. Yoo and their employees will demonstrate the equipment and discuss their spotting, finishing and cleaning practices with cleaners. Information on the CARB grant program will also be provided to interested cleaners.

(see **Showcase** page 3)

## D5 (Continued from Front Page)

A number of years ago, EPA asked the silicone industry to conduct various types of toxicity tests on D5 and other similar compounds. One of the chronic toxicity tests completed a few years ago found uterine tumors in female rats from exposure to D5. The industry group representing D5 manufacturers, Silicones Environmental Health and Safety Council (SEHSC), indicated that D5 was a dopamine agonist and proposed a mechanism or mode of action to explain the tumor formation in rodents. They argued that it was not a pathway that was applicable to humans. OEHHA evaluated the data submitted by the industry on the mechanism and also spoke with EPA scientists who reviewed material on D5 toxicity, particularly on the mechanism, under their own regulatory program. OEHHA also examined other information on D5 from the literature.

OEHHA found that the data submitted by the industry are not sufficient to validate the mechanism the industry proposed for the tumor formation. EPA's scientists apparently also concluded that the proposed mechanism is not valid. Furthermore, OEHHA concluded that "more widespread exposure to D5 has potential public health

impacts" because D5 is a dopamine agonist. Based on available data, OEHHA also found that D5 appears to have significant bioaccumulative potential. The persistence of D5 in the environment and in animal and human tissues is a concern. The agency stated that they "could not conclude at this time that D5 is non-toxic."

D5 is a chemical that is relatively new to the market. It was first proposed as an alternative to ozone depleting solvents in the 1990s. Since then, it has been used extensively in dry cleaning, cleaning and in consumer products. The many dry cleaners using D5 are taking a risk, using a solvent that is an animal carcinogen. The technicians in the auto repair industry and workers in industrial facilities using it in parts cleaners are also at risk. Consumers using it in numerous products like shampoos and personal lubricants are also exposing themselves to a risk. IRTA completed a project sponsored by the Hazard Evaluation System & Information Service (HESIS) and EPA on emerging solvents a few years ago. The project evaluated alternatives to D5. For more information on the products that contain D5, access the final report on

IRTA's website at [www.irta.us](http://www.irta.us).

D5, like many other new chemicals that enter the market, is advertised as a safer alternative to other materials like ozone depleting substances and PERC. These so-called safer alternatives generally have not undergone toxicity testing and scrutiny. As more toxicity data becomes available, as is the case for D5, the conclusion is that D5 may actually be just as dangerous as PERC. The vendor literature indicates that the chemical is non-toxic. D5 has been deemed exempt from VOC regulations; it is not on the Hazardous Air Pollutant (HAP) list because it was not on the market in 1989 when the list was made; no worker exposure limit for the chemical has been established; and it is not a RCRA listed hazardous waste. Because it is not a VOC, air regulatory agencies do not require permits to use it and it is used without constraints by dry cleaners, industrial firms and consumers. This is obviously a very dangerous situation. Perhaps CARB, based on the OEHHA and EPA evaluations, should consider listing D5 as a Toxic Air Contaminant (TAC). If it were so listed, there would be some constraints on its use.

For more information on D5 alternatives, call IRTA at (818) 244-0300. 

## Showcase

(continued from page 2)

IRTA recently completed a project sponsored by Cal/EPA's Department of Toxic Substances Control and U.S. EPA to identify, develop and test alternative low-VOC, low toxicity POG spotting agents. IRTA has developed a fact sheet on safer alternative spotting agents and it will also be available at the showcase.

Legacy Cleaners is using two of the spotting agents, one a water-based cleaner and one a soy based cleaner, that were tested by IRTA during the project.

IRTA will hold one additional showcase with a cleaner located in the Bay Area. IRTA is also planning an EXPO for cleaners to find out more about the carbon dioxide and water-based cleaning technologies. This EXPO will feature talks by clean-

ers who are using the safer cleaning methods. It will be held in April, 2008.

For more information on the showcase, the Legacy Cleaners case study, the spotting chemical fact sheet and the EXPO, contact Katy Wolf at IRTA at (818) 244-0300. The Legacy Cleaners mailout including the case study is also available on IRTA's website at [www.irta.us](http://www.irta.us). 



# Architectural Coating Companies Formulating Primers With Tert-Butyl Acetate

Tert-Butyl Acetate (TBAC) is a solvent that was deemed exempt from VOC regulations by EPA on November 29, 2004. TBAC forms a metabolite called tert-butyl alcohol (TBA) that is a carcinogen. The California Air Resources Board (CARB) and local air districts must also take action for a chemical to be exempt from VOC regulations in California.

CARB did exempt TBAC from VOC regulations in the Suggested Control Measure (SCM) for the autobody industry. An SCM is not a regulation but rather a template for a regulation that can be adopted by the local air districts. The San Joachin Valley Air Pollution Control District, for instance, adopted the CARB SCM as a regulation; it exempts TBAC across the board for all applications including use in cleaning and in coatings. The South Coast Air Quality Management District (SCAQMD) developed their own regulation, Rule 1151, for the autobody industry. SCAQMD exempted TBAC more narrowly than the CARB SCM, only for use in autobody primers.

SCAQMD finalized a regulation on architectural coatings, Rule 1113, recently. This regulation exempted TBAC from VOC regulations in Industrial Maintenance (IM) primers. The District determined there were a number of IM primers which did not contain TBAC that met the future lower VOC limit. Even so, the District decided to exempt the chemical for use in primers to provide "maximum flexibility" to the industry. CARB is developing an SCM for architectural coatings and has decided not to exempt TBAC.

The Office of Environmental Health Hazard Assessment (OEHHA) evaluated the toxicity of TBAC and TBA at CARB's request. OEHHA found that TBA, the metabolic product of TBAC, has been shown to induce tumors in both rats and mice. OEHHA determined a cancer potency factor for TBA and indicated that exposure to TBAC might

result in a cancer risk. The OEHHA staff also wrote a journal article that concluded that TBAC "should be considered to pose a potential cancer risk to humans because of the metabolic conversion" to TBA.

CARB and SCAQMD used the cancer potency factor developed by OEHHA to calculate the risk to the community if TBAC were used in autobody shops. Both agencies concluded that the risk was below the "significance" level. The Hazard Evaluation System & Information Service (HESIS) used the OEHHA cancer potency factor to determine the risk to workers. If TBAC is used at the current occupational exposure limit, the lifetime cancer risk to a worker amounts to 74,000 in a million. This is an extremely high risk. The air agencies ignored the risk to workers in their judgement that the risk is below the significance level.

As part of a project to demonstrate a laser for stripping coatings, IRTA has been examining industrial maintenance coatings. The laser will be demonstrated for stripping the IM coating from a large water storage tank. IRTA contacted a few large IM coating suppliers and they have said they are using TBAC in their IM primers. One supplier even indicated that the SCAQMD asked them to use the chemical. His interpretation is that the District action to exempt TBAC for IM primers is the same as a request to use it. It is clear that TBAC will be used in IM primers. Companies that don't wish to have the primer used on their equipment can request non-TBAC IM coatings but the suppliers may have no non-TBAC containing primers.

California certainly has a problem with smog and reducing VOC emissions is a priority. Even so, it is not good public policy to promote the use of a carcinogen, whatever risk it poses, to replace VOCs. Policies instead should discourage the use of chemicals that pose a cancer risk in all applications.



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Read back issues of The Alternative and recently completed reports.

## SCAQMD and CARB Dry Cleaning Deadlines in Effect

The South Coast Air Quality Management District (SCAQMD) adopted a regulation to phase out the use of perchloroethylene (PERC) in 2020. The regulation, Rule 1421 "Control of Perchloroethylene Emissions From Dry Cleaning Systems," phases out the use of PERC in 2020.

The SCAQMD regulation also has certain interim limits. By November 1, 2007, no dry cleaning facility was allowed to operate a dry cleaning system without secondary control. Several hundred cleaning facilities with machines that only have primary control were affected by this provision. The SCAQMD indicates that inspectors are being sent out to all the facilities that do not have secondary control PERC machines. Some cleaners have been visited by inspectors and told they must shut down their machines. According to industry sources, cleaners are still calling vendors to purchase new equipment that uses alternative cleaning methods so they can continue operating.

Over a year ago, the District required cleaners to report on their future plans, whether they would adopt a PERC alternative or continue to use PERC. For facilities that decided to continue with PERC, the District provided a PERC limit based on a risk assessment. Many cleaners received this new permit limit which represents the amount of PERC they are allowed to emit. If they exceed this limit, they will be issued a violation. Some of the limits received by PERC cleaners will be difficult to meet. The cleaners may assume they will not be caught but the California Air Resources Board (CARB) state regulation (see below) requires suppliers to keep records of which cleaners they sell PERC to and how much PERC they sell to them. SCAQMD can access this data to insure cleaners are not violating their permit limits.

The CARB regulation calls for a complete phaseout of PERC in dry cleaning by 2023. Cleaners must stop using their PERC machines when they are 15 years old. Beginning on January 1, 2008, cleaners were not allowed to install new PERC machines. By July 1, 2010, all machines that are 15 years old or older must be removed from service. If a cleaner has a machine that is 10 years old, the machine can only be operated for another five years. At that stage, the cleaner would have to convert to an alternative technology. The CARB regulation also requires distributors of PERC to keep records.

There are many alternatives to PERC that are safer. The best alternatives from an overall health and environmental standpoint are water-based and carbon dioxide technologies. Most cleaners are converting to hydrocarbon. Although there do not appear to be toxicity issues with hydrocarbon, the material is a VOC. An article in this issue of the newsletter describes a review by the Office of Environmental Health Hazard Assessment (OEHHA) on the toxicity of Green Earth. The chemical is a carcinogen and it is also persistent in the environment. n-Propyl bromide (NPB) is another solvent that is being marketed to this industry. NPB is a VOC, it is a reproductive toxin and it causes nerve damage. The chemical is also unstable when it takes up water which is naturally present in the dry cleaning process. Although stabilizers can be used, if there is not enough stabilizer or if it becomes depleted, the solvent will "go acid." It will form hydrobromic acid which will corrode the machine and could be extremely dangerous to people.

For more information on PERC dry cleaning alternatives, contact IRTA at (818) 244-0300.



### Need help finding an alternative?

IRTA assists firms in converting to suitable alternatives in cleaning, paint stripping, coating electronics and adhesive applications.

For more information, visit us on the web at:

[www.irta.us](http://www.irta.us)

or contact us at: 818-244-0300

## SCAQMD to Develop Regulation on Lubricants and Rust Inhibitors

The South Coast Air Quality Management District (SCAQMD) is planning to begin development of a VOC regulation for lubricants and rust inhibitors in 2008. The District's Air Quality Management Plan (AQMP) identifies this as one of the areas where VOC reductions will be achieved.

Several years ago, IRTA conducted a project sponsored by U.S. EPA that focused on finding alternatives to VOC emitting lubricants and chlorinated paraffin lubricants. IRTA found alternatives to the VOC emitting lubricants and several of the companies participating in the project elected to convert their operations. IRTA conducted another project, sponsored by SCAQMD and U.S. EPA, that was designed to test alternatives to vanishing oils and VOC emitting rust inhibitors. IRTA found alternatives and again, some of the facilities participating in the project converted their operations. A report that summarizes the results of the work on VOC emitting lubricants and rust inhibitors for both projects is available on IRTA's website at [www.irta.us](http://www.irta.us).

Hundreds of companies use petroleum

based lubricants and rust inhibitors as part of their manufacturing or rebuilding operations. Some of these materials are classified as VOCs. In particular, vanishing oils are generally petroleum solvents that are emitted slowly. In many cases, rust inhibitors are also formulated with petroleum solvents. The alternatives for VOC emitting lubricants and rust inhibitors that IRTA tested and demonstrated during the two projects were water-based and vegetable based products. Many companies are already using these materials and they have used them successfully for several years.

The California Air Resources Board (CARB) is proposing a lower VOC limit for the consumer product category called Lubricants/Penetrants. Products like WD-40 are included in this category. CARB is proposing a VOC limit of 25 percent. The CARB Board is planning to hold a hearing on the regulation in June, 2008.

For more information on alternative lubricants and rust inhibitors, call IRTA at (818) 244-0300.



### Rule 1171

(continued from front page)

The PIA coordinated the testing with users and suppliers but focused on cleanup materials for conventional rather than UV/EB inks. In contrast, the screen printing industry did very little testing and most suppliers did not make any effort whatsoever to develop low-VOC alternatives. The PIA requested an additional year to find alternatives for cleanup of UV/EB ink which accounts for an estimated four percent of the solvent emissions from lithographic printing. The screen printing industry requested more time to develop cleanup materials for all cleaning tasks in their industry.

The SCAQMD is proposing to grant an extension to the lithographic printing industry for cleanup materials used for UV/EB ink in recognition of the hard work the industry did for conventional ink users to meet the January 1, 2008 deadline. The District is currently proposing that the VOC content limit for cleanup materials for UV/EB inks be delayed until January 1, 2009.

Screen printers clean at two stages in the printing process. Ink is cleaned from screens during printing to keep the excess ink from building up; this is called on-press cleaning. Ink is also cleaned

from screens at the end of the printing process when the screens are recycled; this is called recycling cleanup. The SCAQMD is proposing to extend the VOC content limit for on-press screen printing cleanup materials until January 1, 2009. In many operations, the majority of the cleaning is performed on-press. In granting the extension for on-press cleaning, the District is delaying compliance that leads to substantial emissions. The industry has also requested an extension for cleanup materials used for recycling cleanup for automated presses. The District has decided to grant this request. If the District extends the deadline for all on-press cleaning and for automated equipment recycling cleanup, nearly all cleanup in the industry will be covered by the extension. It does not seem reasonable for the District to reward this industry when the members have done very little work to find low-VOC alternatives. The lithographic printing industry worked hard on alternatives and the vast majority of that industry will have to comply with the January 1, 2008 VOC limit.

If the District grants an extension for cleanup materials used for recycling cleanup for automated presses, a key decision will be in the definition of "automated equipment." For example,

(see **Rule 1171** page 7)

**Rule 1171**

(continued from page 6)

textile printers, who account for half to two-thirds of the screen printing industry, often clean during recycling with spray systems or parts cleaners. Both types of systems have pumps so they might be able to claim the systems are automated. If virtually all the equipment used by the industry is classified as automated, nearly all the cleaning performed by the industry will be covered by the extension.

The printing industries have had nine years to comply with the 100 gram per liter VOC limit. The extensions the District is proposing for the screen printing industry do not recognize the effort made by the lithographic printing industry to comply with the lower limits. The extensions do not represent good public policy since they reward an industry that performed very little work on finding alternatives.

The District is also proposing to add provisions to the rule that would include solvent suppli-

ers. Suppliers would be required to provide written dilution instructions for the formulations if appropriate. They would also be required to keep records of solvent cleaning materials they sold for three years. Full service suppliers, which are suppliers that lease equipment and/or haul waste in addition to providing the cleaner, would be liable for supplying users non-compliant solvents.

The solvent suppliers are opposed to the new provisions that would affect them. In many cases, suppliers do support the so-called prohibition of sale. It is the language of the prohibitions they object to. This provision is very controversial and it is not clear how the District plans to respond to industry complaints.

SCAQMD is taking comments on their proposed rule changes. The rule is scheduled to be heard on February 1, 2008 by the District Governing Board.

For information on the alternatives IRTA tested, access IRTA's website at [www.irta.us](http://www.irta.us) or call IRTA at (818) 244-0300.



“My industry worked hard on alternatives. We have to comply with the regulation by January 1, 2008.”

“My industry did no work on alternatives. We got an extension and don’t have to comply with the regulation until January 1, 2009. We plan to ask for another extension next year.”

# CALENDAR

## January 1

Effective Date for SCAQMD Rule 1171 VOC limits for non-UV/EB cleanup materials for lithographic printing and a small portion of the screen printing industry cleanup. For information contact Lee Lockie at (909) 396-2390.

## January 10th

First face to face meeting of the DTSC Green Chemistry Science Advisory Panel, San Francisco, CA. For information, contact Kathy Barwick at (916) 323-3381.

## January 26

Showcase for Green Jet and wet cleaning technologies at Legacy Cleaners, 2306 Park Avenue., Tustin, CA 92780, 9AM to 1PM.

## February 4 - 7

10th California Unified Program Annual Training Conference, Hyatt Regency San Francisco Airport. For information call, (530) 676-0815.

## March 31 - April 3

WESTEC, Los Angeles Convention Center, Los Angeles, CA. For Information, access [www.sme.org/westec](http://www.sme.org/westec).

**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!

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