

The Alternative

IRTA Newsletter

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Summer 2007

EPA Lists n-Propyl Bromide Acceptable in Solvent Cleaning Sector and Unacceptable in Adhesives and Aerosols

On June 3, 2003, under the Significant New Alternatives Policy (SNAP) program, EPA proposed to list n-propyl bromide (NPB) as an acceptable substitute for 1,1,1-trichloroethane (TCA) and CFC-113 in metals cleaning, electronics cleaning, precision cleaning, aerosols and adhesives. At that time, EPA indicated that users should meet a voluntary Acceptable Exposure Limit (AEL) of 25 ppm. Based on information received since that time, EPA adopted a final rule for the solvent cleaning sector and a new proposed rule for adhesives, aerosols and coatings on May 30, 2007. The final rule deems NPB acceptable as an alternative to ozone depleting solvents in metals cleaning, electronics cleaning and precision cleaning. This time, however, EPA declined to establish an AEL for NPB in these applications. The proposed rule deems NPB unacceptable for use in adhesives and aerosols and acceptable, subject to use conditions, for use in coatings.

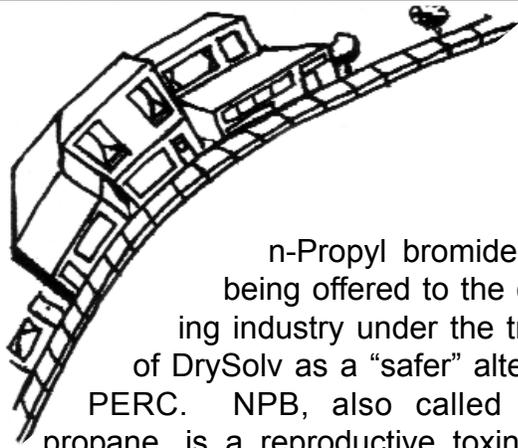
NPB, also called 1-bromopropane, is a reproductive toxin and it can harm the nervous system. It causes sterility in both male and female test animals and harms the developing fetus when tested in pregnant animals. It can damage the nerves, causing weakness, pain, numbness and paralysis. It is currently undergoing tests to determine whether it causes cancer as many similar chemicals do.

The Occupational Safety and Health Administration (OSHA) has not established a worker exposure limit for NPB. A few years ago, the American Conference of

Governmental Industrial Hygienists (ACGIH) recommended an exposure level of 10 ppm for the chemical. In July of 2003, the Hazard Evaluation System & Information Service (HESIS), which is part of the California Department of Health Services, issued a Health Hazard Alert (HHA) for NPB. The HHA recommends that workplace exposure be limited to about 1 ppm in order to protect against the reproductive and nerve toxicity of NPB.

EPA did not accept the ACGIH or HESIS limits as valid after reviewing the toxicity information on NPB. EPA believes the chemical can be used safely when exposure is below about 18 ppm. From data obtained primarily from suppliers of NPB, EPA indicates that concentrations of NPB used in vapor degreasers for metals cleaning, electronics cleaning and precision cleaning are below the 18 ppm limit.

Companies using NPB in vapor degreasers are generally doing so to avoid complying with the Halogenated Solvent Cleaning National Emission Standards for Hazardous Air Pollutants (NESHAP). The NESHAP applies to TCA, trichloroethylene, perchloroethylene and methylene chloride used in cleaning applications. It requires those solvent users to have relatively tight vapor degreasing equipment. NPB is not listed as a NESHAP solvent so vapor degreaser users do not have to comply with the more stringent requirements of the NESHAP if they use NPB. Since most companies using NPB are doing so to avoid upgrading their equipment, it is very
(see *n-Propyl Bromide Listing* page 6)



n-Propyl bromide (NPB) is being offered to the dry cleaning industry under the tradename of DrySolv as a “safer” alternative to PERC. NPB, also called 1-bromopropane, is a reproductive toxin and can harm the nervous system. It causes sterility in both male and female test animals and harms the developing fetus when tested in pregnant animals. NPB can damage the nerves, causing weakness, pain, numbness and paralysis. It is undergoing testing to determine whether it causes cancer, as many similar chemicals do.

NPB is very unstable when water is present and stabilizers are added to the chemical to prevent it from forming hydrogen bromide, a very toxic acid. In some vapor degreaser applications, the stabilizer has been depleted and severe accidents that corrode the equipment have occurred. In dry cleaning, cleaners are taking a risk in using NPB. The suppliers are recommending the solvent be used without filters and the reason is that the filters will remove the stabilizer. They are also recommending that cleaners distill the solvent after every load and the reason for this is also to keep the stabilizer in the NPB.

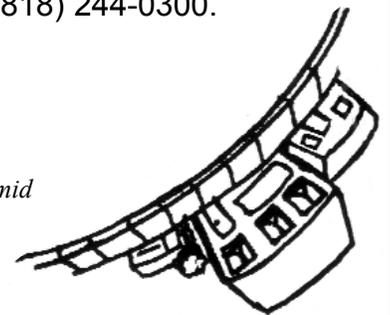
Small Business Corner

n-Propyl Bromide Marketed as DrySolv to Dry Cleaning Industry

Many dry cleaners are small mom-and-pop facilities. The suppliers indicate NPB can be used in existing perchloroethylene (PERC) machines. Unsophisticated cleaners may try to use the solvent in PERC machines that have filters and they may not take care to distill after every load. It is only a matter of time until an accident occurs in the dry cleaning industry from depletion of the stabilizer. In addition, older PERC machines are very emissive and the exposure of workers and owners can be very high. In the adhesive industry (see article on NPB in this issue), NPB has caused nerve damage in workers and this is likely to happen in dry cleaning as well.

PERC dry cleaning has been phased out in California by 2023. There are a number of alternatives that are much safer than PERC and they are also much safer than NPB. If you need information on dry cleaning alternatives, call IRTA at (818) 244-0300.

Illustration by Todd Schmid



SCAQMD Modifies Permit Rule

On June 1, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted a modification to the District’s permit rule that affects users of ultraviolet (UV) and electron beam (EB) curable products like coatings, adhesives and inks. SCAQMD Rule 219 exempts equipment that emits small levels of emissions from permit requirements.

In the past, Rule 219 included an unrestricted and unlimited exemption for equipment using UV and EB curable materials. The modification removed the unlimited exemption for

this equipment and substituted a generous permit exemption. It also expanded the exemption to other technologies that have ultra-low emissions. Some of the ultra-low VOC alternative technologies available today have lower emissions than UV/EB materials.

The District is beginning a program to test the VOC content of many UV/EB materials to have a better idea of the emissions from a variety of these products. This will allow a comparison of the VOC content of UV/EB materials and other ultra-low VOC products.



IRTA Initiates CARB Project on Dry Cleaning Alternatives

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 the 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. The South Coast Air Quality Management District adopted a regulation that phases out PERC earlier, in 2020. Because of these regulations, cleaners in California will have to adopt alternatives over the next few years.

IRTA recently received a grant from CARB to work with cleaners who have converted to carbon dioxide and/or water-based technologies. The project involves finding cleaners throughout the state who are willing to act as showcase facilities to feature the alternatives. The showcases will be held on a Sunday so cleaners in the area can visit the facility and discuss the alternatives with the owners and managers. They will provide information on how to use the alternatives and what spotting and finishing methods are optimal. Equipment suppliers will also be on hand to answer questions. As part of the project, IRTA is preparing a cost analysis for each of the showcase facilities so other cleaners can find out about the cost of using the alternatives.

The first showcase facility is Mastercraft Solvent Free Dry Cleaning, located in the Fig Garden area of Fresno. The case study for this

facility, including a cost analysis, is published in this issue of the newsletter. The showcase for this cleaner, which has a wet cleaning system and a Green Jet machine, is scheduled for August 19.

The second showcase facility is Hangers Cleaners in Torrey Hills which is near San Diego. The case study for this facility is also included in this issue of the newsletter. The showcase for this cleaner, which has a carbon dioxide machine, will be held on September 23rd.

IRTA will hold three additional showcases with two cleaners in the Los Angeles area and one cleaner in the Bay Area.

The project also involves developing a fact sheet on safer alternative spotting agents for the textile cleaning industry. IRTA recently completed a project, sponsored by Cal/EPA's Department of Toxic Substances Control and U.S. EPA, that included demonstrating safer spotting agents. The industry currently uses spotting agents based on trichloroethylene (TCE) and PERC. TCE, like PERC, is a carcinogen. Alternatives that proved effective include water-based, soy based and glycol ether based spotting agents. This fact sheet will be distributed at the showcases and will be available from IRTA.

As part of the CARB project, IRTA is also planning to hold an EXPO on the safer alternatives at Southern California Edison's CTAC facility in Irwindale, California next year. The EXPO will feature cleaners who have converted to the safer alternatives. Suppliers of alternative equipment will also attend to answer questions about their technologies.



Need an alternative? Want to learn more about IRTA?

Visit us on the web at: www.irta.us

or contact us at: 818-244-0300

Fresno Cleaner Adopts Water-Based Cleaning Technology

Mastercraft® Solvent Free Dry Cleaning, a high-end textile cleaner with 1,750 square feet, is located in the Fig Garden shopping center in Fresno. Steve Berglund, owner of Mastercraft®, has nearly 40 years of experience in the textile cleaning industry. He has a total of seven patents and 13 trademarks. Mastercraft® offers unique personalized services including Super Shirt which combines a patented collar shaper, sleeve holder and cuff links for laundered shirts and the convenient Handy Hamper®, an express bag designed by Berglund.

Over the years, Mastercraft® has received several awards. Mastercraft® was honored as best-in-the-nation in design, marketing and promotion by the American Dry Cleaning magazine in 1982. In 2006, the magazine gave the shop the Outstanding Niche Operation award.

In 2002, Mr. Berglund purchased a Green Jet machine which uses a spray of water and detergent to clean garments. He was one of the first cleaners in the nation to adopt this technology. Says Mr. Berglund, "Mastercraft® has always been a leader." He closed down a perchloroethylene (PERC) dry

cleaning machine at the same time. "I saw the writing on the wall and thought PERC would be phased out. I wanted to use a safe technology that would reduce the risk to my workers and customers," says Mr. Berglund. The California Air Resources Board recently adopted a regulation that will gradually phase out PERC dry cleaning by 2023.

The shop uses both wet cleaning and the Green Jet equipment. Many of Mastercraft's® upscale customers' garments are not heavily soiled so they are easily cleaned in the Green Jet. About half the garments cleaned in the shop are wet cleaned and half are processed through the Green Jet. "Until recently, I didn't have a humidity controlled dryer for the wet cleaning system or tensioning equipment for the finishing," says Mr. Berglund. "The structured garments, like a man's suit jacket, for example, are easily finished if they go through the Green Jet."

The cost of using the Green Jet is lower than the cost of using PERC. "I want to be progressive in terms of the environment and health but I also must have a profitable business," says Mr. Berglund. "I'm saving money and doing the right thing at the same time." 🌱

Annualized Cost Comparison for Mastercraft® Natural Cleaning		
	PERC	Green Jet
Annualized Capital Cost	-	\$1,295
Solvent Cost	\$3,600	-
Detergent Cost	\$300	\$1,170
Electricity Cost	\$4,000	\$4,000
Gas Cost	\$2,500	-
Spotting Labor Cost	\$5,460	\$6,552
Finishing Labor Cost	\$18,428	\$18,428
Maintenance Labor Cost	\$2,040	\$320
Maintenance Equipment Cost	\$1,470	-
Compliance Cost	\$370	-
Waste Disposal Cost	\$1,839	-
Total Cost	\$40,007	\$31,765

San Diego Cleaner Adopts Carbon Dioxide Technology

Hangers Cleaners, a high end textile cleaning facility, was first opened in Mission Valley near San Diego in 2001. The Hangers owner, Gordon Shaw, opened a second facility in Torrey Hills in 2005. Both facilities have 60 pound carbon dioxide machines.

Mr. Shaw has been a dry cleaner for many years and he operated five different perchloroethylene (PERC) plants before 2001. He did not want to use PERC at the new locations. The solvent poses health and environmental problems and it has been phased out in California. Says Mr. Shaw, "I investigated the carbon dioxide process and decided it was a good technology, particularly for the upscale clientele my shops serve."

The customers at the first Hangers location were enthusiastic about using a "green" alternative like carbon dioxide. The success of the first store prompted Mr. Shaw to open the second cleaning store and two additional drop stores in the San Diego area. Mr. Shaw was one of the first cleaners in the country to use

carbon dioxide and he is a pioneer for the industry. In the last few months, Mr. Shaw has been featured by Newsweek in several articles in a series on www.msnbc.com.

The carbon dioxide machine operates at 700 to 900 pounds per square inch pressure to keep the carbon dioxide liquefied. The cycle is 44 minutes, about the same as a PERC machine. "Carbon dioxide is a gentle cleaner because the process doesn't use heat and the solvent is less dense than other liquids," says Mr. Shaw. "Finishing is the same with carbon dioxide and PERC and I can now process delicate items that I couldn't clean with PERC." He does indicate, however, that more spotting is required with the carbon dioxide technology.

Many cleaners are concerned about the phaseout of PERC in California. "I would strongly recommend that cleaners in upscale areas look at the carbon dioxide technology," says Mr. Shaw. "It is an effective alternative to PERC."



Annualized Cost for Hangers Cleaners in Torrey Hills	
	Carbon Dioxide
Annualized Capital Cost	\$11,550
Carbon Dioxide Cost	\$10,851
Detergent Cost	\$5,285
Electricity Cost	\$15,221
Gas Cost	\$10,431
Spotting Labor Cost	\$7,800
Finishing Labor Cost	\$156,000
Maintenance Labor Cost	\$1,352
Maintenance Equipment Cost	\$5,200
Waste Disposal Cost	\$800
Total Cost	\$224,490

For back issues of "The Alternative," visit us online at www.irta.us.

SCAQMD Adopts Certification Program for Janitorial Products

On April 6, the South Coast Air Quality Management District (SCAQMD) Governing Board adopted a voluntary certification program for consumer cleaning products used at institutional and commercial facilities. The products covered in the program include air fresheners, bathroom and tile cleaners, carpet and upholstery cleaners, floor polish or wax, floor wax strippers, general purpose cleaners, general purpose degreasers, glass cleaners, household products, metal polish/cleansers and toilet and urinal care products.

The program is called the Clean Air Choices Cleaner Certification Program. It is similar to the Clean Air Solvent Certification (CAS) Program which was adopted several years ago for industrial cleaners. That program has 140 products that have been certified by the District offered by 73 companies. The CAS Program requires the products to have a VOC content of 25 grams per liter or less. The new consumer cleaner certification program has a more stringent requirement; eligible products must have a VOC content of 10 grams per liter or less.

The new voluntary program offers two methods to companies to have their products certified. First, companies can submit products to SCAQMD and the SCAQMD lab will test the products to verify that the VOC content meets the specified limit. The lab will also verify that no prohibited ingredients are present at a level of 0.1 percent by weight or greater. Prohibited ingredients include Toxic Air Contaminants, Hazardous Air Pollutants, Ozone Depleting Compounds, Global Warming Compounds, Heavy Metals, Great Waters Pollutants of Concern, Carcinogens and Reproductive

Toxins, Alkylphenol Ethoxylates and Dibutyl Phthalates. Second, companies can present proof of certification from an approved third-party life-cycle assessment organization for the non-VOC content portion of the requirements.

The District analyzed several different products in a variety of the consumer cleaning products categories to determine whether there were products that could meet the 10 gram per liter VOC content limit. The preliminary results indicated that seventeen products representing bathroom cleaners, carpet cleaners, general purpose cleaners, glass cleaners and household cleaners had a VOC content less than 10 grams per liter.

The purpose of the voluntary program is to positively influence consumer behavior in choosing ultra-low VOC products and encourage marketing of ultra-low VOC technologies for reducing VOC emissions. At the public hearing on April 6, the Governing Board discussed the possibility of developing a regulation for the cleaners which would be mandatory rather than voluntary.

The SCAQMD's Air Quality Management Plan (AQMP) indicates the District plans to develop a regulation for another consumer product category "Lacquer Thinner" in the future. IRTA recently completed a project sponsored by Cal/EPA's Department of Toxic Substances Control that involved identifying, developing and testing alternative consumer product cleanup materials and thinners. The alternatives that were tested had very low VOC content and they could serve as alternatives to lacquer thinner.

For more information on the program, contact IRTA at (818)244-0300. 

n-Propyl Bromide Listing

(Continued from Front Page)

likely that their workers are facing exposures well above 18 ppm.

There is no reason for a company to use NPB in vapor degreasing. First, there are many effective alternatives available that are much safer than NPB. IRTA has demonstrated alternatives in these applications. The South Coast Air Quality Management District

(SCAQMD), which covers half the state of California, no longer allows the use of NPB in open top vapor degreasers. Since NPB is not used in half of California, it demonstrates that users have found viable, safer alternatives. Second, NPB is very unstable to hydrolysis so stabilizers are added to it to prevent it from forming dangerous gases like hydrogen bromide. Some users have had NPB "go acid" (See **n-Propyl Bromide Listing** Page 7)

n-Propyl Bromide Listing

(Continued from Page 6)

and this situation is very dangerous. Third, companies using NPB in vapor degreasers are taking a risk that they will be liable if workers are injured.

The EPA proposal deemed NPB unacceptable for use in adhesives, apparently because the agency believed that worker exposure was higher in these applications. Data on worker exposure was collected by the National Institute for Occupational Safety and Health (NIOSH) in foam fabrication facilities. The data indicate that exposure is very high, in some cases. Workers in the foam fabrication sector have experienced nervous system disorders and lawsuits have been filed against the company using it and their adhesive supplier.

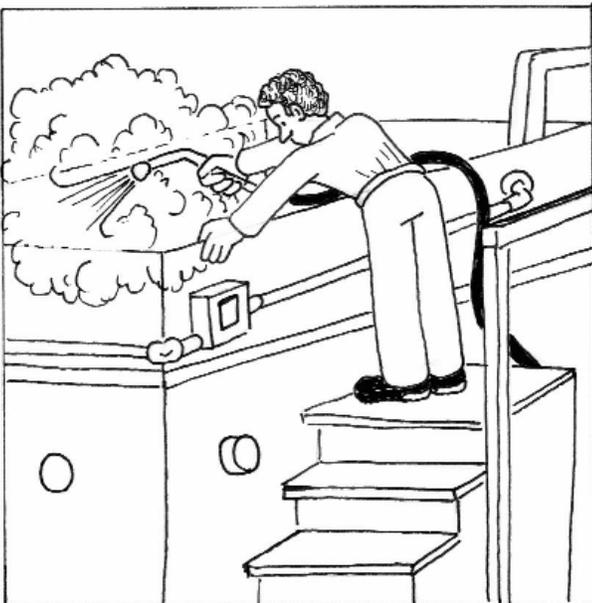
IRTA has worked on alternatives in adhesive applications. Safer alternatives to NPB are widely available and used by many foam fabricators. These alternatives include water-based and acetone based formulations. Many foam fabricators have been using these safer materials for several years.

In the proposal, EPA also found NPB unacceptable for use in aerosol applications, again apparently because of higher exposure in that sector. NPB is primarily used in aerosols for electronics cleaning or for contact cleaning of various types of equipment. The

solvent used widely in these applications in the past is HCFC-141b. Production of the chemical has been banned because it causes ozone depletion and the stockpiles are now close to being depleted. Suppliers are selling NPB based aerosols as alternatives to HCFC-141b. The EPA ruling will now prevent NPB from being used in these applications.

In the May 30 proposal, EPA deemed NPB acceptable, subject to use conditions, for use in coatings. In order to use NPB in this sector, a facility must provide EPA with information that demonstrates their ability to maintain worker exposure levels in the range of 17 to 30 ppm by May 30, 2007. One facility, Lake City Army Ammunition Plant, did provide EPA with this information. The company uses a sealant containing NPB and claims there are no viable alternatives. It is unlikely any other company would want to use NPB in coatings since it is much more expensive than a range of safer alternatives that are commonly used in these applications today.

It is not clear why EPA approved NPB for use in metals cleaning, electronics cleaning and precision cleaning. There are many safer alternatives that are being and can be used effectively in every application. If you are using NPB and would like to find an alternative, contact IRTA at (818) 244-0300.



Vapor Degreasing With NPB
Approved by EPA



Adhesive Application With NPB
Not Approved by EPA

CALENDAR

July 30

Deadline for comments on EPA's Federal Register Notice on n-propyl bromide use in adhesives, coatings and aerosols. For information, contact Margaret Sheppard at (202)343-9163

September 23

Showcase at Hangers Cleaners, Torrey Hills Marketplace, 4645 Carmel Mountain Road, San Diego, CA 92130. For Information, call IRTA at (818)244-0300

August 19

Showcase at Mastercraft® Solvent Free Dry Cleaning, Fig Garden Village, 5142 N. Palm Ave., Fresno, CA 93704. For information call IRTA at (818)244-0300

October 23 through 25

Western Regional Pollution Prevention Network Conference, Bahia Hotel, San Diego, CA. For information, access www.wrppn.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!

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