

How to get toxic cleaning products out of your workplace and out of the environment



# Cleaners and Toxins Guide



Labour Environmental  
Alliance Society

## CLEANERS AND TOXINS

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### ► BENEFITING HEALTH AND THE ENVIRONMENT

## The Cleaners and Toxins projects

Take a look inside the warehouse of any cleaning product distributor and you'll get an idea of the huge volumes of industrial cleaning products that are used in this country. Every day, millions of litres of products are swished across floors and poured into commercial dishwashers and washers. When the cleaning jobs are done, cleaners and wastewater are dumped into sewage lines.



Some are safe enough and will biodegrade easily. But too many of them contain toxic ingredients that pose not only a hazard to the workers using them, but also to the environment. Some even contain carcinogens — cancer-causing substances — or ingredients that can have adverse effects on reproduction in humans and animals.

Clearly, eliminating the toxic ingredients from these cleaning products would bring tremendous benefits to society — in reduced occupational disease, as well as cleaner air and water.

That connection is what prompted the Labour Environmental Alliance Society (LEAS) to launch the Cleaners, Toxins and the Ecosystem project in 2001. From that, LEAS developed the Training for a Non-Toxic Workplace project, with support from WorkSafeBC. This edition of the Cleaners and Toxins Guide was developed in conjunction with participants in that project.

For a year, LEAS worked closely with custodians in a number of school districts, as well as the staff in major hotels. Cleaning products were reviewed and training provided to help OH&S committees in identifying products that contain toxic ingredients. The objective was to involve OH&S committees and others at the workplace level in replacing those toxic cleaning products with safer, “green” products and in setting up a product review process for all future purchasing. The project, and the work that LEAS has done in many other worksites shows that it is an example that can be followed in many other industries and workplaces.





## ► CHANGING THE WAY WE CLEAN

### Going green — and why it's important

Do cleaning products really make that much of a difference? Are safer, environmentally-preferable products that important when there are bigger issues like climate change?

Those are genuine questions raised by custodial and housekeeping workers. And the answer to both of them is an unqualified “yes.” That’s why many institutions and governments, such as the BC Buildings Corporation and New York State schools have changed to environmentally-preferable cleaning for the buildings under their jurisdiction.

Here’s why it’s so important:

- Reducing or even eliminating the use of toxic cleaning products creates a safer workplace, by reducing the incidence of diseases, such as occupational asthma and cancer, that are related to chemical exposure. Where the workplace is a school or a hospital, it can also benefit children and others who would otherwise be exposed to toxins.
- Using non-toxic cleaning products stops environmental contaminants from going into the waste stream. That is the most effective form of pollution prevention.
- Green cleaning can even make a difference on climate change. Many environmentally-preferable products have eliminated the use of petroleum-based solvents. And reducing the use of bleach and chlorine-based ingredients reduces energy use, since much of the world’s chlorine is still produced by methods based on a high consumption of energy.
- Promoting the use of environmentally-preferable cleaning products increases the demand for them, increasing the number of suppliers and manufacturers and reducing costs. It also promotes the development of superior products that perform as well or better than many of those containing toxic ingredients.
- Reviewing product use and promoting positive change can energize occupational health and safety committees and encourage workers’ participation in other environmental initiatives.

### ▶ TOXIC INGREDIENTS AND CHRONIC EFFECTS

## Cleaning products affect your health

Cleaning products are supposed to make our workplaces cleaner and even disinfect them, in some cases. How can they be toxic?

In fact many cleaning products contain ingredients that can have serious health effects. Some can cause liver or kidney damage. Some may contain carcinogens, substances that can cause cancer. Some ingredients can be sensitizers that can trigger severe allergic reactions for some people after an initial exposure. Some, known as endocrine-disrupting chemicals, can interfere with the body's hormone system or affect reproductive processes.




Being exposed to these toxins doesn't automatically lead to health problems. Some people are affected while others are not, for reasons that often have to do with their genetic makeup. But there is ample scientific evidence demonstrating the toxic effects of certain chemicals. That's why exposure to them should be reduced, or even eliminated, wherever possible.

There has been a marked increase in many forms of cancer since World War II. During the 1930s, there was a one-in-10 incidence of cancer among Canadians. By the 1970s, it had risen sharply to one in five. Today, an average of one in every 2.5 Canadians will develop cancer in his or her lifetime.

While there are genetic and life-style causes of cancer, current studies indicate that between 10 and 16 per cent of cancers are occupationally-related. Lab experiments with animals have shown many of the possible health effects that can also occur in humans. And much of the knowledge we have about carcinogenic chemicals in the workplace has come from the medical records of workers who developed cancer while working in certain industries where they were exposed regularly to those chemicals.

The UN's International Agency for Research on Cancer (IARC) developed a list





of known and possible human carcinogens, based on human evidence and laboratory tests with animals. IARC lists carcinogens as Group 1 (carcinogenic to humans); Group 2A (probably carcinogenic to humans); 2B (possibly carcinogenic to humans); and Group 3 (suspect — insufficient evidence). Other agencies, including the American Conference of Governmental and Industrial Hygienists — used by WorkSafeBC as a reference — have also developed lists. ACGIH lists carcinogens as A1 (known) and A2 (suspected).

### Identifying toxic chemicals


One carcinogenic chemical used in cleaning products is paradichlorobenzene, used in many urinal and deodorant blocks. It has been linked a form of cancer known as non-Hodgkin's lymphoma. For that reason, IARC has designated it as a possible human carcinogen.

Many commercial laundry detergents, floor cleaners and other products contain ethoxylated nonyl phenols, a group of endocrine-disrupting chemicals. They act like the female hormone estrogen and can interfere with hormonal processes. They've been declared toxic by Environment Canada under the provisions of the Canadian Environmental Protection Act.

Another common cleaning product ingredient is 2-butoxyethanol. It can cause liver and kidney damage on long-term exposure and may also affect reproduction, by reducing sperm production in men, for example.

While in many cases, the exposures may be small, the important thing to remember is the cumulative effect over time and in some cases, the timing of the exposure. For example, sexual organs develop at Day 56 of gestation. If a pregnant worker were exposed at this time, it could be a factor in the later development of testicular cancer for her male child, for example.

Across the continent, there are more than 75,000 chemicals in use in industry. Yet barely 10 per cent of those ingredients have been fully tested for their health and environmental effects. That means there's still a lot we don't know. But where we do know that a toxic chemical ingredient can cause serious health effects, it's important to take action and make changes.



**More important than the size of the dose is its cumulative effect over time and in some cases, the timing of the exposure.**

### ▶ TOXINS ACCUMULATING IN WILDLIFE

## Cleaning products affect the environment

Few Canadians give much thought to what happens to cleaning products when they are poured down the drain or flushed down the toilet. Some people may think the chemicals become diluted and have dissolved before they enter the sewage system. They hope that the sewage system neutralizes them before they enter rivers and the ocean, making them safe for the fish and marine and aquatic environment.

It doesn't happen that way.

Many chemicals, such as PFOA, a chemical used in the manufacture of Teflon, and PCBs, used for years in electrical transformers, can persist in the environment for years. As fish and other marine animals are exposed to them, the chemicals can bio-accumulate, or reach higher levels in the fat and vital organs of those animals.

Polar bears, even though they live in remote northern areas, far from industrial pollution, have shown dramatically increased levels of highly toxic PCBs. The toxins are carried on ocean currents where they're picked up by seals and fish, and accumulate in their fat and tissue. The bears eat the contaminated fish, pushing the levels of accumulated PCBs even higher.

There's a saying that "everything in nature goes somewhere," and that includes the ingredients in cleaning products. Pollutants that are dumped into our waters make their way to the far reaches of the planet, carried by ocean currents as well as by migratory birds and fish.

Even many cleaning product products such as nonyl phenols, pose a problem because they are not removed from the waste stream by sewage treatment plants. They also belong to a group of chemical toxins known as "endocrine-disrupting chemicals," (EDCs), that can interfere with the proper functioning of the endocrine system — the hormone-producing organs of the body, such as thyroid, and male testes. For example, male fish exposed





to nonyl phenols in wastewater can develop female characteristics, impairing their reproductive ability.

Trisodium nitrilotriacetate, a chemical that is still widely used in commercial laundry detergents and other cleaning products, can re-dissolve heavy metals that have settled in river and marine sediments. Those metals can be toxic to fish and other marine and aquatic life.

The toxic ingredients outlined in the pages in this booklet represent only a small fraction of the industrial chemicals used across Canada each year. Yet even our list includes several carcinogens, reproductive toxins and endocrine-disrupting chemicals, as well as numerous other toxins that are harmful to human health and the environment.

### Toxins show up in wastewater

An analysis of the wastewater leaving the Iona primary sewage treatment plant in Richmond in southern B.C. reveals where those toxins are going. According to monitoring by the Greater Vancouver Regional District, the effluent flowing out of the Iona treatment plant into the river and ocean environment contains a host of toxins, including carcinogens such as naphthalene, and endocrine disrupters such as nonyl phenols — both of which are found in custodial products.

It's true that sewage treatment in many B.C. cities, especially in the Metro Vancouver and Victoria areas, is still inadequate. An upgrade to full secondary treatment or better is obviously necessary. But source control — eliminating pollution at its source — is vitally important.

There are clear benefits for both human health and the environment if we can stop using products containing toxic ingredients and prevent them from going into the waste stream in the first place. And action at every workplace can make a difference.

### Basic Principle Taking a precautionary approach

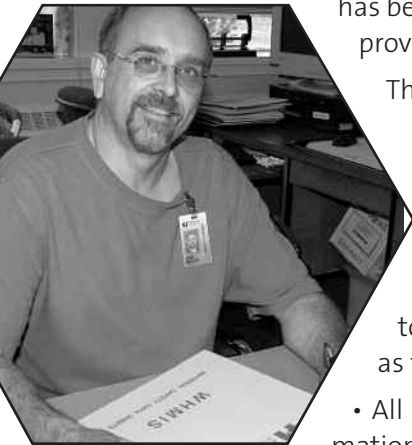
'The precautionary principle requires authorities to take preventive action when there is a risk of severe and irreversible damage. Action is required even in the absence of certainty about possible ensuing damage and without waiting for full scientific proof of the cause-effect relationship. When disagreement exists about the need to take action, the burden of proof must be reversed and placed on those who contend the activity will not have an impact.'

— *from the National Roundtable on the Environment and the Economy: Sustainable Strategy for Oceans, 1998*

### ▶ REGULATIONS COVER HAZARDOUS PRODUCTS

## WHMIS, MSDS: what do they mean?

All workers in Canada have the right to know the potential health hazards of chemical products they use in the workplace. Canada's right-to-know law is the Workplace Hazardous Materials Information System, or WHMIS. Originally enacted as federal legislation in 1988, WHMIS has been adopted by all provinces and incorporated into provincial health and safety regulations.



The three basic requirements of WHMIS are:

- All workplace chemicals must be labelled by the supplier, with WHMIS labels that identify the health hazards associated with their use;
- All workers using or exposed to a controlled product (hazardous material) must have access to the supplier's Material Safety Data Sheet, known as the MSDS;
- All workers must be educated concerning the information on the MSDS, and trained in safety precautions when handling the product.

WHMIS does not require special labelling or MSDS for consumer products that may be used in the workplace. However, under the WorkSafeBC Occupational Health and Safety Regulation, the employer must still ensure that information is provided relating to the potential health effects of any hazardous ingredients it contains.

## MSDS: reading between the lines

A supplier has offered a brand new product for cleaning staff to try. But how do you know what's in it and what effects those ingredients might have?

The Material Safety Data Sheet (MSDS) is the first place to go for ingredient information. It's important to ensure that the MSDS is up to date — it must have been prepared within the last three years — that it has been prepared in compliance with WHMIS and is easily accessible on the worksite.



## Make sure it's WHMIS-compliant

To be WHMIS-compliant, all MSDS must carry 54 items of information, ranging from the product manufacturer to the potential health effects of any hazardous ingredients. Often, suppliers provide MSDS that are prepared to U.S. standards, which are not the same, so it's a good idea to check to see if there is at least a reference to WHMIS on the sheet. WHMIS regulations state that if the sheet doesn't provide all the information required, a new sheet should be requested and the product should not be used until a WHMIS-compliant sheet has been provided.

WorkSafeBC publishes a booklet entitled WHMIS at Work that provides details on the 54 items of information required in an MSDS and a glossary of the various terms used. The booklet is available as a free pdf download from the WorkSafeBC site, at [www.worksafebc.com](http://www.worksafebc.com)

The WorkSafeBC Occupational Health and Safety Regulation states that MSDS should be "readily available" to workers. Computer access is allowed, but the sheets must still be readily available and all workers should be trained in accessing the database. If your electronic system requires a special operator or requires that you go to another site to receive a fax, it's better to download MSDS for products that you use regularly and keep them in a binder, updating them as needed.

Two sections of the MSDS are most important in identifying potentially toxic chemicals in the workplace:

- **Hazardous ingredients**, which outlines the potentially toxic chemicals in the product or mixture.
- **Toxicological properties**, which states potential health effects of an ingredient, and identifies hazards, such as carcinogens or reproductive toxins.

## MSDS Violations Data on chemicals not always accurate

Is the ingredient information in Material Safety Data Sheets accurate? According to the results of a federal review, it may not always be, making it especially important to check the information against other sources. In 2005-06, the federal Hazardous Materials Information Review Commission (HMIRC) found 2,605 violations among the MSDS it reviewed, a 25 per cent increase since 2003-04. Of those violations, nearly half — 47 per cent — involved hazardous ingredients or toxicological information. The violations included failure to identify chemicals, unauthorized trade secret exemptions and undisclosed chronic and acute health effects of chemical ingredients.

### ▶ REVIEWING THE HAZARDOUS INGREDIENTS

## Steps to a healthier workplace

Once you have a WHMIS-compliant Material Safety Data Sheet, you can go over the ingredients in a step-by-step process.


- First check the hazardous ingredients. Are there any that appear on the Do Not Use list in this Guide (outlined on pages 14-15)? If so, flag them for follow-up action by your committee.
- Are there any ingredients that appear on the Try and Find Substitutes list (pages 16-17)? If there are, take note of them and check the percentage concentration for each of them. In some cases, the concentration of an ingredient may be low and the product may be used infrequently. Those are factors in determining whether the product should be used.
- Check the pH of the product itself, in the pH box on the MSDS. The pH number is a system used to indicate whether a substance is acidic (pH less than 7) or alkaline (pH greater than 7). Most products are within the range of 2.5 to 12.5, but those with a lower or higher pH can be extremely corrosive, posing a health hazard to users. If you come across a product with a pH that is below 2.5 or above 12.5, flag that product so that your committee can look at how it is used and consider whether a safer product should be substituted.

### Check toxicological properties for hazards

- Check the toxicological properties section, usually midway through the MSDS. This section is where chronic hazards associated with exposures are listed and it is in this section that any references to carcinogens, reproductive toxins and sensitizers will be listed. WHMIS regulations require suppliers to outline any acute or chronic health hazards, that could result from

## Toxic Effect Disinfectant overexposure led to death

A worker complained of respiratory irritation from using a bathtub cleaner and disinfectant in the course of her work in a B.C. Interior health care institution. Despite her symptoms, she continued to do the work as directed by her employer. One day, after she had completed her shift, she went home, feeling ill. She later collapsed and died. Her union took the case to the Workers' Compensation Board and did research on the ingredients in the cleaning solutions. It was found that she had been exposed to excessive levels of "quats" (see note on opposite page), which were probably the cause of her death.



exposure to a particular ingredient. Acute effects, such as dizziness and damage to the eyes, are those that result from short-term exposure. Chronic effects, such as cancer or damage to the liver and kidneys, are those health effects that could result from long-term exposure, which could be anywhere from several days to years.

In addition, the MSDS is required to list seven specific categories of hazards. Five of those are of particular concern: carcinogenicity (potential to cause cancer); sensitization (potential to cause severe allergic reaction on repeated exposure); teratogenicity (potential to cause damage to a developing fetus); mutagenicity (potential to cause genetic mutations — often related to cancer); reproductive toxicity (potential to impair reproduction).

- If the MSDS indicates any of those five hazards, flag the product for follow-up action by your committee. If you find that the sheet repeatedly puts the letters N/A (not available) opposite each category, it may be an indication that key information is missing. See pages 18 and 19 for help on looking up information on the ingredients yourself.

If you find that a product contains an IARC carcinogen listed on pages 14-15, but there is no reference in the toxicological properties section, the supplier should be asked for a sheet that contains the required information. In the meantime, the product should not be used.

### Create a list of products for follow-up

- Based on your review, create a list of products that contain the toxic ingredients so that your committee can review them for follow-up action.

In some cases, you may want to get more information on the ingredients so that the committee has more to work with. If so, consider using some of the Internet sources outlined on pages 18 and 19 of this Guide. There are a number of links to different sites where you can do your own research.

## Health Alert Quats may be sensitizers for some

Many workplaces, especially health care facilities and schools, use disinfecting products known as “quats.” They come in various chemical formulations, but all are part of the family of quaternary ammonium chlorides — hence the term “quats.” There is some concern about their potential as sensitizers. For about five per cent of people, quats can be potent sensitizers and can cause a range of asthma-like symptoms, including respiratory arrest. If symptoms appear, the worker should immediately stop using the product. Quats should not be used with hot running water because the steam can increase the inhalation of vapours, adding to the risk of health effects.

## KEEP THESE SUBSTANCES OUT OF YOUR WORKPLACE!

THE FOLLOWING ARE SOME OF THE MOST TOXIC INGREDIENTS FOUND IN CLEANING PRODUCTS.

### **XI** 2-Butoxyethanol

CAS 111-76-2

This ingredient, a common solvent used in cleaning products, may cause liver, kidney and reproductive damage, including damage to the male testes and the developing fetus. It has been listed as CEPA-toxic under the Canadian Environmental Protection Act. Used in heavy duty cleaners, floor strippers, rug spotters and degreasers.

### **XI** Cocamide diethanolamine

CAS 68603-42-9

This ingredient is a suspected carcinogen in the U.S. based on laboratory experiments conducted under the U.S. National Toxicology Program that determined it caused malignant tumours in mice. Used in all purpose cleaners and machine-dispensed hand soaps.

### **XI** Dibutyl phthalate

CAS 84-74-2

This ingredient is a severe skin irritant and may cause kidney damage and damage to the developing fetus. It is also an “endocrine disrupter” the name given to



**Do Not Use**  
any of these  
products

the group of chemicals that can affect the hormone-producing organs of the body. It is a R-designated substance (reproductive toxicant) on the American Conference of Government Industrial Hygienists list, the reference list used by WorkSafeBC. Used in floor care products and hard surface cleaners.

### **XI** Ethoxylated nonyl phenol

CAS 9016-45-9

Ethoxylated nonyl phenols, or NPEs, are also endocrine disrupters and have been listed as CEPA-toxic. Other CAS numbers for NPEs that commonly occur in cleaning products are 26027-38-3 and 7311-27-5. Used in laundry detergents, all purpose cleaners and other products.

### **XI** Hydrofluorosilicic acid

CAS 16961-83-4

This ingredient is highly corrosive and irritating and according to the MSDS, prolonged exposure could cause “skin and eye damage, tissue damage, respiratory disorder or lung damage.” Used in laundry soaps to reduce the alkalinity of waste water.

### **XI** Methyl ethyl ketone

CAS 78-93-3

This is a liver, kidney, skin and reproductive system toxicant. Used in hard surface cleaners and laundry starches.

## **❖ Methylene chloride**

CAS 75-09-2

Also known as dichloromethane, this is a Group 2B carcinogen (possible human carcinogen), according to the International Agency for Research on Cancer (IARC). It can also cause liver and brain damage on inhalation. Used in paint strippers and stain and graffiti removers.

## **❖ Naphthalene**

CAS 91-20-3

This is a carcinogen listed under California's Proposition 65. It may also cause blood, kidney, liver, gastrointestinal and developmental damage. Used in mothballs and pest repellents.

## **❖ N-methyl-2-pyrrolidone**

CAS 872-50-4

Listed as a known reproductive toxicant under California's Proposition 65, this ingredient may also cause liver and kidney damage. Used in carpet care products, floor strippers and graffiti wipes.

## **❖ Paradichlorobenzene**

CAS 106-46-7

Known also as p-Dichlorobenzene and 1,4-Dichlorobenzene, this is an IARC 2B carcinogen (possible human carcinogen) and a liver and kidney toxicant. Used in washroom deodorizers and urinal blocks.

## **❖ Silica**

CAS 14808-60-7;14464-46-1

Often listed as quartz, silica, in the form of respirable dust, is an IARC Group 1 carcinogen (known human carcinogen). Used in powdered abrasive cleaners.

## **❖ Styrene**

CAS 100-42-5

This is an IARC 2B carcinogen (possible human carcinogen) and a liver, kidney and reproductive toxicant. Used in some floor finishes

## **❖ Tetrachloroethylene**

CAS 127-18-4

Also known as perchloroethylene, this is an IARC Group 2A carcinogen (probable human carcinogen). Used in furniture polishes and graffiti removers as well rug and upholstery cleaners.

## **❖ Trisodium nitrilotriacetate**

CAS 18662-53-8; 5064-31-3

This is an IARC 2B carcinogen (possible human carcinogen) and an environmental contaminant. Used in carpet treatments and dishwasher detergents.

## **❖ Toluene**

CAS 108-88-3

Exposure to this ingredient may cause liver, kidney and brain damage and damage to the developing fetus. Used in specialty cleaning products such as vandal mark removers.

## **❖ Trichloroethylene**

CAS 79-01-6

This ingredient is an IARC 2A carcinogen (probable human carcinogen) and may cause liver, kidney and respiratory system damage. High exposures can lead to irregular heartbeat, which could be fatal. Used in spot cleaners and degreasers.

## TRY TO GET SUBSTITUTES FOR THESE SUBSTANCES!

NOT AS TOXIC AS THOSE ON THE PRECEDING PAGES, THESE SHOULD STILL BE REPLACED IF POSSIBLE.

### Acetone

CAS 67-64-1

This ingredient may cause liver and kidney damage and damage to the developing fetus. Used in mark and scuff removers, spot treatment cleaners and other products.

### Ammonia

CAS 7664-41-7

This ingredient is an extreme eye and respiratory irritant and reacts with bleach to form poisonous chloramine gas. It can also cause kidney and liver damage. Ammonia has been listed as CEPA-toxic to the marine environment under the provisions of the Canadian Environmental Protection Act (CEPA). Used in liquid glass cleaners and hard surface cleaners.

### Amyl acetate

CAS 628-63-7

This is a severe skin and respiratory tract irritant that may cause cracking of the skin on prolonged use. It may also cause kidney damage. Used in metal polishes.

Look for  
SUBSTITUTES  
for these  
ingredients

### Cyclohexanol

CAS 108-93-0

A suspected reproductive toxicant, this ingredient may also be a liver, kidney, blood, and neurotoxicant (having toxic effects on the central nervous system). Used in glass and hard surface cleaning products.

### Diethanolamine

CAS 111-42-2

This is a liver, kidney, respiratory and neuro-toxicant and may also be a skin sensitizer. Used in commercial dishwasher detergents, floor care, carpet and upholstery cleaning products.

### Diethylene glycol monomethyl ether

CAS 111-77-3


This ingredient is a liver, kidney and neuro-toxicant. In laboratory experiments, it has also been shown to affect the reproductive system. Used in hard surface cleaners and floor care products.

### Hydrochloric acid

CAS 7467-01-0

A liver and gastrointestinal toxicant, hydrochloric acid is extremely irritating to the lungs and respiratory tract and repeated high exposures may result in chronic damage. Long term exposure may cause yellowing and erosion of the





tooth enamel. If splashed, it can cause burns to eyes and skin. Used in toilet bowl cleaners and concrete cleaners.

### **?** Morpholine

CAS 110-91-8

This ingredient is corrosive and can severely irritate and burn the skin and eyes, potentially leading to blindness if splashed in the eyes. It may also cause liver and kidney damage and long-term exposure may result in bronchitis. Used as a solvent in some cleaning products, including abrasive cleansers.

### **?** Monoethanolamine

CAS 141-43-5

High and repeated exposures of this ingredient may cause liver, kidney and reproductive damage as well as depression of the central nervous system. Inhaling concentrated fumes — when using an oven cleaner with a high concentration of monoethanolamine, for example — may cause dizziness and even coma. Monoethanolamine can also be absorbed through the skin. Used in oven cleaners, tub and tile cleaners, laundry pre-soaks, floor strippers and carpet cleaners.

### **?** Sodium dichloro isocyanurate

CAS 2893-78-9

This ingredient, which is chlorine-based, is extremely caustic and may cause permanent eye damage if the liquid product is splashed in the eyes. It is also a liver and gastrointestinal toxicant. Used in germicidal cleaners, institutional dish-washing detergents and disinfectant blocks.

### **?** Sodium hypochlorite

CAS 7681-52-9

The main ingredient in bleach, this is a severe irritant that can create poisonous chloramine gas if mixed accidentally with ammonia, or chlorine gas if mixed with acids. In the environment, bleach is particularly harmful because as sodium hypochlorite breaks down, the chlorine readily binds with organic material to create small amounts of substances called organochlorines. Those organochlorines are highly toxic to shellfish and other aquatic and marine life. Found in chlorine bleach as well as wash-room cleaners.

### **?** Turpentine

CAS 8006-64-2

Turpentine can cause kidney, bladder and central nervous system damage. Turpentine containing delta-carene is also a skin sensitizer. Used in some specialty solvent cleaners.

### **?** Xylene

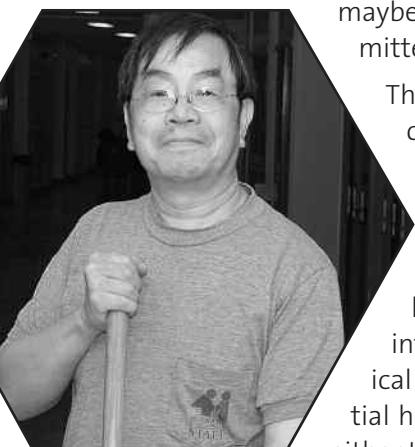
CAS 1330-20-7

This ingredient may cause liver and kidney damage and damage to the developing fetus. Repeated exposure to xylene can lead to loss of memory and high exposure can lead to loss of consciousness and even death. Used in floor polishes, graffiti and vandal mark removers, laundry spot removers and ironing aids.

### ▶ LINKS AND DATABASES ON YOUR COMPUTER

## Using the Internet to find out more

The ingredients outlined in the previous pages provide a good checklist when you're reading through the hazardous ingredients list on the MSDS and flagging certain ingredients. But maybe you've come across an ingredient that seems toxic but isn't on either one of the lists. Or maybe you just want more information for your committee to consider.



There is a lot more information available that's as close as your computer. Here are some of the sites you can use to fill in your knowledge.


### Internet sites

One of the most useful resources is a database known as Scorecard-About the Chemicals. It's an interactive site that allows you to search the chemical database and get information about the potential health effects of specific chemicals. You can enter either the name of a chemical ingredient or its Chemical Abstract Service (CAS) number. Using the CAS number is the preferred method because chemicals can have several different names but only one CAS number. That makes it a unique identifier.

The Scorecard site, which is maintained by the U.S. group Environmental Defense, doesn't include every chemical used in the cleaning product industry, but the list is quite extensive. One point to remember: it makes reference to California's Proposition 65 list of carcinogens, rather than IARC. However, the California list is very authoritative and closely parallels the IARC list. If a chemical is identified on the Proposition 65 list as a carcinogen, it certainly should be a candidate for substitution.

### Using the LEAS links page

To get to the Scorecard site, you can go directly to [www.scorecard.org](http://www.scorecard.org) > About the Chemicals or you can go through the Labour Environmental Alliance Society site, which has the added benefit of links to other useful sites. Go to



www.leas.ca, click on Resources (top menu, at right) and navigate to Links > Cleaners and Toxins Links. The Scorecard link is midway down the page.

At the top of the LEAS Cleaners and Toxins Links page is the link to the American Conference of Governmental Industrial Hygienists' (ACGIH) exposures table, currently used by WorkSafeBC.

The table lists the recommended exposure limits for hundreds of hazardous chemicals. The right hand column of the table lists the specific health hazards associated with each chemical, as determined by WorkSafeBC. An Ingredient may be designated as a carcinogen (A1, A2, 1, 2A, or 2B), a reproductive toxin (R) or a sensitizer (S). To make that search easier, download the list as a pdf (see link at the beginning of the table). That will allow you to search the document by CAS number using the search function available in the free program Adobe Acrobat reader.

### California lists reproductive toxins

Also on the LEAS Links page is the Proposition 65 list of carcinogens and reproductive toxins. Most of the carcinogens are also listed on the ACGIH-WorkSafeBC table, but the California list of reproductive toxins is much more extensive. If one of the cleaning products you are using contains an ingredient that is on the California list, but not on the ACGIH-WorkSafeBC list, you should take the product to your committee and request that it be replaced with a safer product.

Another useful resource is the link to the list of New Jersey Facts Sheets, near the bottom of the Links page. New Jersey has strong right-to-know workplace regulations and the state's Department of Health and Senior Services has prepared several hundred facts sheets on the potential health effects of various industrial chemicals. The facts sheets are listed alphabetically by chemical name and can be downloaded as pdf files and printed.

## Laser Fallout Precoated paper causes lung damage

An office worker complained of irritating fumes when printing several hundred dayglo-type signs on a small laser printer. Ventilation was poor and something on the precoated paper was reacting with the printer. The MSDS did not mention this as a possible problem. Complaints of acute respiratory irritation began to multiply. One person ended up off work and was later diagnosed with severe lung damage. Analysis of the MSDS revealed that one of the ingredients in the coating could release a respiratory sensitizer when reacting with the heat from the laser printer. The coated paper was removed and another safer product substituted.

### ► STRATEGIES FOR MAKING A CHANGE

## Regulations assist in product substitution

The chemical ingredients outlined on the preceding pages can cause serious health effects. The lists are not intended to be complete — they focus on some of the most common toxic ingredients found in cleaning products. Substitutes should be found for them, wherever possible.




In British Columbia, the Workers Compensation Act and the WorkSafeBC Occupational Health and Safety Regulation give workers specific rights in dealing with hazardous materials in the workplace.

- **The right to know** The federal Workplace Hazardous Material Information System (WHMIS) provides information on hazardous materials used in the workplace. All provinces have provincial health and safety regulations that implement WHMIS in the province.
- **The right to participate** The B.C. Workers Compensation Act provides for joint employer-worker Occupational Health and Safety (OH&S) committees.
- **The right to refuse** Part 3.12 of the WorkSafeBC OH&S Regulation outlines the right to refuse unsafe work if it poses an undue hazard.
- **The right to no discrimination** The Regulation also protects workers from discriminatory action for refusing unsafe work.

## Regulating hazardous substances

The WorkSafeBC Regulation has two major sections devoted to hazardous substance exposure in the workplace.

- **Part 5** Chemical and Biological Exposures outlines the provisions of WHMIS and specifies how it should be applied in B.C., including workplace monitoring and exposure plans.
- **Part 6** Substance Specific Requirements outlines specific provisions for special materials, such as asbestos, pesticides and biohazardous materials.



One specific section under Part 5 gives workers specific rights to request substitution when certain designated chemicals are being used. The section is known as Part 5.57 (see sidebar).

### Designated chemicals in ACGIH table

The designated chemicals are outlined in the list that WorkSafeBC uses for its reference, a list developed by the American Conference of Governmental Industrial Hygienists (ACGIH). The list is available online at the WorkSafeBC site under OHS Regulation > Part 5 > Table of Exposure Limits (or see the links on page 21).

The ACGIH list specifies the recommended exposure limits for various hazardous chemicals and designates some of them into special categories. They may be listed as A1 (ACGIH confirmed) or A2 (suspected) carcinogens, IARC 1 (known human ) 2A (probable human) or 2B (possible human) carcinogens, R for ACGIH reproductive toxins or S for ACGIH sensitizers.

(In 2007, ACGIH dropped its R and S designations, which will mean changes to Part 5.57 of the B.C. Regulation. However, WorkSafeBC was expected to keep all currently designated substances and others may be added.)

Under the WorkSafeBC regulation, all employers are required to provide a safer substitute for any product that contains designated ingredients, if that safer substitute exists. In most cases, safer substitutes can be found, especially in the cleaning product category.

Workers covered by the federal Occupational Health and Safety Code also have the right to seek substitution of toxic chemicals, although the regulation doesn't make specific reference to a list of designated chemicals. Section 10:16 of the Code states: "No person shall use a hazardous substance in a work place where it is reasonably practicable to substitute a substance for it that is not a hazardous substance."

## OH&S Reg Part 5.57 Replacing toxic chemicals

(1) If a substance identified in ACGIH or IARC by any of the following notations, abbreviations, or endnotes is present in the workplace, the employer must replace it, if practicable, with a material which reduces the risk to workers:

- (a) ACGIH A1 or A2, or IARC 1, 2A or 2B carcinogen,
- (b) reproductive critical effects,
- (c) sensitization critical effect or SEN notation, or
- (d) L endnote.

### ► SUPPLIER THE FIRST STOP FOR SUBSTITUTES

## Making the change on the product list

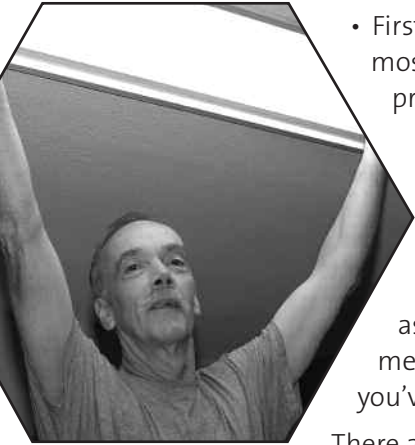
Now you've reviewed the MSDS and you've got a list of products and ingredients you want to get out of your workplace. How do you go about making those changes?

Here are some practical steps:

- First, look carefully at the list of products with the most toxic ingredients and determine if all those products are really needed.
- Once you've established a list of essential cleaning products, ask your Occupational Health and Safety Committee to arrange a meeting with suppliers. Show the supplier the list of ingredients that are not to be used in the workplace and ask for products that meet your cleaning requirements but avoid the use of the toxic ingredients that you've named.

There are thousands of cleaning products available so it is usually possible to get a substitute product, especially since more institutional buyers are demanding safer products and the number of "green" products has grown considerably in recent years.

- Before any orders are placed, your health and safety committee should request that suppliers provide MSDS on any suggested products. That way, you can review the ingredients of any new products before they're bought.
- Your committee can make product review a permanent part of the process by developing a cleaning product purchasing policy for your workplace, company or public agency. Many cities and institutions in the U.S. have very strict purchasing policies that spell out product standards as well as restricted ingredients. The idea is catching on in Canada as health and environmental awareness grows. Your committee can help purchasing staff develop its own policy by outlining specific standards that you establish or by adopting a policy already in place in another similar workplace.





▶ ALTERNATIVE PRODUCTS MORE AVAILABLE

## Green certification makes choice easier

There are many changes taking place in the cleaning product industry. Partly, it's because of projects like ours but it's also because many workplaces are demanding less toxic, less polluting products.

Several companies now specialize in green products while many conventional product manufacturers have come out with a green line of products.

Some of the companies in Canada supplying less toxic, environmentally preferable products include Ultra Chem Industries, Enviro-Solutions, Chemspec (Detergent-Free Cleaning system), Spartan (Green Solutions), Rochester-Midland's (EnviroChem products), and Zep (Green Link line).

Not all the products have eliminated the ingredients outlined in this guide, so it's important to review MSDS before purchasing.

However, many of green products from the companies listed come with an environmental certification from either Environmental Choice or Green Seal that makes the job of choosing a substitute product a lot easier. Environmental Choice was established by Environment Canada, but the certification is carried out by an independent party, Terra Choice. The criteria for products are quite strict and are established through a multi-stakeholder consultation. Green Seal is a similar certification system in the U.S.

Both Environmental Choice and Green Seal set various standards for products, based on meeting certain health and environmental criteria, as well as performance. In order to be certified, companies must submit their products for testing, along with a full disclosure of all ingredients. Certified products are entitled to carry the Environmental Choice or Green Seal logo.

Those products that carry the certification are usually a good choice, although it's still important to review all MSDS before making a decision to order products. A list of Environmental Choice certified companies and products is available at: [www.environmentalchoice.com/English/Home/](http://www.environmentalchoice.com/English/Home/)



**Many green cleaning products now come with an environmental certification from either Environmental Choice or Green Seal.**

OH&S COMMITTEES MAKING CHANGES

## Successful substitutions

The following are just a few of the toxic ingredients encountered during the course of the projects that have been flagged by joint occupational health and safety committees and replaced with safer substitutes.

Work site	Product used	Problem ingredient	Potential health effect	Action taken
School district	Carpet cleaner	Methylene chloride	Possible human carcinogen	substituted
Recreation centre	Foam cleaner	2-butoxyethanol	Liver, kidney, reproductive effects	substituted
Care facility	Laundry detergent	Ethoxylated nonyl phenol	Endocrine disrupter	substituted
Care facility	Carpet treatment	Trisodium nitrilotriacetate	Possible human carcinogen	substituted
Care facility	Foam cleaner	Cocamide diethanolamine	Suspected carcinogen	substituted
Office centre	Urinal blocks	Paradichlorobenzene	Possible human carcinogen	eliminated
School district	Graffiti remover	Tetrachloroethylene	Probable human carcinogen	eliminated
School district	Floor finish	Dibutyl phthalate	Reproductive damage	substituted
Hotel	Metal polish	Silica	Known human carcinogen	substituted



## ▶ GLOVES, GOGGLES BASIC EQUIPMENT

### Protect yourself — follow safety procedure

Everybody benefits if we're able to eliminate carcinogens and other toxic ingredients from the workplace. But even less toxic ingredients can be harmful if they're not handled properly.

Safe handling practices are very important in dealing with any chemical substances.

- Always use recommended safety equipment: gloves, goggles, masks or other protection.
- Mix concentrated cleaning products in the proportions recommended by the manufacturer/supplier.

In many cases, the safety data in MSDS is based on using the product at the recommended dilution. You could potentially exceed recommended exposure limits if you use it at higher concentrations or even full strength.

- Never mix different cleaning products unless it is recommended by the manufacturer. Sometime the combinations can be deadly — bleach and ammonia, for example.

This is particularly important in dealing with products that call for extra care — flammable products or products with corrosive ingredients, for example. If the MSDS recommends the use of safety goggles or neoprene gloves — use them. Some ingredients can be absorbed through the skin and gloves are the first line of defence.

Make sure your employer has an eyewash station whenever cleaning products with corrosive ingredients are being used or mixed.

### Deadly Mix Always follow directions in product use

Following directions in preparing cleaning solutions from concentrate and never mixing cleaning product ingredients are fundamentals in commercial and institutional cleaning. In June, 2002 a part-time caretaker in a Toronto school was rushed to the emergency ward after complaining to a co-worker that she was unable to breathe. She later died in hospital. Investigators looking into the incident discovered that she had mixed a sanitizing product that contained sodium hypochlorite (the active ingredient in chlorine bleach) with an acid-based toilet bowl cleaner. The two ingredients had reacted together to form deadly chlorine gas, which led to her death.

### ▶ EXTENDING THE WORKPLACE RIGHT TO KNOW

## Consumers deserve hazard labelling too

Since federal WHMIS legislation was first adopted in 1988, it has required that any worker using a hazardous material in the workplace must have access to a Material Safety Data Sheet (MSDS). The sheet must identify the hazardous ingredients in the product and the short and long-term health hazards that may be associated with those ingredients. The legislation gives workers the right to know what they may be exposed to and the right to know the health effects associated with that exposure.



But consumers in Canada do not have that right to know — even if they're using the same products in their homes.

Both manufacturers and retailers contend that a WHMIS regulation would not be practical for consumer products because of the huge number of products available in many stores and the need to stock hundreds of different MSDS.

But shouldn't consumers have a fundamental right to know what they're being exposed to in the products they buy? Shouldn't there be information on the product packaging — with a list of hazardous ingredients and plain language phrases or symbols indicating any long term health hazards, such as cancer, that may be associated with those ingredients?

Most Canadians answer those questions with a firm "yes." A 2007 Strategic Communications poll in 2007 found that 93 per cent of respondents supported hazard labelling.

Similar product labelling is already the accepted regulatory standard in the State of California and throughout the European Union.

At a time when Canadians are seeking to make changes that will benefit their health and the environment, hazard labelling is more than just a right — it's an essential tool.



## About LEAS

The Labour Environmental Alliance Society (LEAS) was established in 1998 to bring workers and environmentalists together in cooperative projects to create safer, healthier jobs, to eliminate toxins in the workplace and the community, and to protect and revitalize the environment. The board of directors is made up of leading members of environmental organizations and trade unions in B.C.

Since its establishment, LEAS has earned high marks for its work in toxins reduction. In 2001, LEAS launched its innovative Cleaners, Toxins and the Ecosystem project to begin reducing the use of toxic cleaning products in various industrial plants, recreational facilities, schools and health care facilities. Since that time, the organization has worked with numerous unions and other organizations in carrying out audits of workplace cleaning products. LEAS staff also worked with the B.C. Buildings Corporation in developing their environmental cleaning standard.

In recognition of its work, LEAS was the recipient of a 2002 Pollution Prevention Award, presented by the Canadian Council of Ministers of the Environment.

Among LEAS other publications is the popular CancerSmart Consumer Guide, which takes workplace product review into the home and consumer products. The latest edition of the Guide, CancerSmart 3.0 The Consumer Guide, came off the press in September, 2007.

## About the photos

The people whose photos appear throughout this Guide were participants in the Training for a Non-Toxic Workplace project that was carried out between September, 2006 and December, 2007. Front cover, Brian Galbraith, Teresita Arellano; page 3, Naren Chand, John Morton, Rosemary Simituk; page 4, Richard Catling; page 6, Felipe Madrigal; page 8, Rosemary Simituk; page 10, John Morton; page 18, Dave Cheung; page 20, Mark Layzell; page 22, Mike Noble; page 26, Marlon Surilla; back cover, Balwinder Mahil (l), Ralph Loxterkamp (top right).



# Protecting workers' health and the environment



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