G3027

INDOOR AIR QUALITY

Chemical Hazards in the Home

SOLVENTS

Elaine Andrews

What Are Solvents?

Many household products contain solvents. A solvent is a substance that dissolves something else. An example is turpentine, which dissolves paint and grease. Water is the most common solvent, but it is not hazardous as are other solvents. This brochure covers solvents other than water.

Solvents are useful because they can dissolve unwanted dirt, grease or finishes without harming the original material, because they dry quickly, and because they can carry other useful products. Paint pigments and products packaged in an aerosol form are examples of ingredients which must be carried by solvents.

How Do You Know if a Product Contains a Solvent?

Most solvents other than water are known as organic solvents by chemists. Common organic solvents that may appear on product labels are: petroleum distillates, mineral spirits, "chlorinated solvents," carbon tetrachloride (old products only), methylene chloride, trichloroethane and toluene. There are many others.

Reading the product label may not tell you if a product contains a solvent. However, labels can provide clues. A FLAMMABLE designation on a label indicates a high percentage of organic solvent. Older products, however, may not include the flammable designation. Organic solvents are included in hundreds of chemical formulations and have many names for identical compounds. Therefore, to determine whether a product contains a solvent, familiarize yourself with the common solvent-containing products listed below.

Products containing almost 100 percent solvents include: furniture strippers, turpentine, dry-cleaning fluids, paint thinners, nail polish remover and degreasers.

Products composed partially of solvents include: paints, aerosol sprays, furniture oils, shoe care products, spot removers, rug cleaners, glues and adhesives, metal and wood cleaners, and wood finishes such as varnish, shellac, stain and oil.

Consult your local health department, poison control center or consumer hotline if you have any questions about the health risk involved in the use of any product.

Dangers of Solvents

Solvents have the potential to be extremely dangerous to your health and safety. Inhaling fumes or accidentally drinking solvents may lead to disabling diseases or death. The result of exposure depends on:
—The type of solvent,
—How much solvent you are exposed to,
—The frequency and length of the exposures(s), and
—Your weight and physical condition.
Some health hazards occur immediately, but others, such as liver and kidney problems, birth defects and nervous disorders, take a long time to appear or may appear only when someone has been repeatedly exposed to the solvent.

Precautions

Handle all solvent-containing products with care and respect. Pay attention to the warnings detailed below. As a first step in using any product that contains hazardous chemicals, which includes solvents, **read the label and follow the directions.**

Warnings

- Use solvents with utmost care and respect.
- Don't transfer solvents to other unlabeled containers, especially to food or drink containers.
- Keep solvents out of reach of children. Seventy percent of poisoning cases from solvents involve children less than 5 years old.
- Avoid using solvent-containing products near children or pets.
- If you are pregnant or suspect being pregnant, try to avoid solvents.
- If possible. use solvents outdoors on a calm, windless day.
- Indoors, have plenty of good ventilation and fresh air.
- Never smoke or have open fires or sparks nearby when using solvents. Most are flammable.
- If you use solvents for long periods (several hours), take several fresh air breaks. Stop for the day if you feel sick in any way.
- Avoid drinking alcoholic beverages during or after using solvents that day. Alcohol can make solvents more toxic.
- Avoid wearing contact lenses when using solvents. The solvent vapors can get trapped between your eye and lens and damage your eye.
- Protective gloves, glasses and respirators are recommended for prolonged indoor use of solvents. For advice on finding the correct type of equipment, call a safety supply company or the Regional Department of Industry, Labor and Human Relations (DILHR), Safety Consulting Office; their Madison number is 608-266-1930.
- Store solvent containers in a well-ventilated area away from heat or flames.
- Dispose of used solvents and solvent applicators properly. Put clothes permeated with solvent in a secure outdoor area away from flames, pets or children; allow the solvent to evaporate before washing them. Used paint thinner can be strained and reused.
- Follow local solid waste authority recommendations for disposing unused products.

Exposure Warnings

Not all solvents have strong enough odors to warn you that you are breathing them. Other signs of solvent exposure may serve as warnings. These include:
—Itchy, burning or tearing eyes.
—Itchy, burning or dry skin.
—Nose, throat and lung irritations, coughing.
—Nausea and headache.
—Becoming dizzy, light-headed or sleepy.

A Word about Aerosol Sprays

Many consumer products such as cleaners, paints and cosmetics are available in aerosol spray containers. Solvents are used in most of these as part of the product or as the propellant chemical. Accidents, injuries and deaths have occurred from exploding cans, fires and breathing the aerosol contents. Before buying or using aerosol sprays, weigh the convenience against their potential heath and environmental hazards and the added cost you pay for the aerosol spray container and propellant.

Environmental Hazards

Solvents escape to the indoor and outdoor environment from normal use of cleaners, paints, aerosol sprays and other solvent-containing products like those listed earlier. Environmental contamination may result from accidental spills, open containers and inappropriate disposal of used or unused products.

Outdoors, these organic chemicals may contribute to smog-producing air pollutants, contaminate drinking water and harm wildlife. Disposal of solvents and their containers presents a solid waste problem. **Therefore, use products conservatively.** Refer to your local solid waste authority or the resources listed in this brochure for appropriate waste disposal advice.

Indoors, solvents contribute to “tight building” or “sick building” syndrome. Studies have shown that concentrations of these products are low in general, but higher than in outdoor air, even in urban areas. Chronic or long-term health effects from indoor exposure to these chemicals must be considered. Acute health syndromes associated with indoor air exposure to these chemicals include: drowsiness, fatigue, general malaise, headache, and irritation of eyes, mucous membranes and the respiratory system. Indoor exposure from these products may also increase susceptibility to the effects of other pollutants. Susceptible individuals may experience allergic reactions when exposed to these chemicals over time.

Common Health Problems

The harmful effects solvents have on people are not completely known, especially the long-term effects. However, here are some of the most common problems.

Fires

Many solvents are highly flammable. Substantial property damage and deaths result each year from solvent fires.

Poisoning

Accidentally drinking solvents is extremely dangerous. A few teaspoons of certain solvents cause serious adverse effects.

Skin Damage

Most solvents dissolve skin oils, causing skin irritations and damage. Solvents can also pass through the skin into the bloodstream where they circulate through the body and can cause additional damage. Don’t wash your hands with solvents unless the container says you should. Shoes and clothes treated with solvent-containing products should be completely dry before you wear them.

Eye Injury

Solvent vapors and liquids can severely damage your eyes, particularly if you wear contact lenses.

Lung Damage

Breathing solvents is hard to avoid because many evaporate quickly into the air. Solvents also disperse into the air when you apply aerosol cleaning products. Solvents can cause nose and throat irritations, damage lung tissue and easily enter the bloodstream through the lungs. Other symptoms of poisoning may then follow such as dizziness, nausea, headache, sleepiness, clumsiness and irregular heartbeats. Intentionally breathing high concentrations (for example, sniffing the solvents in glue to get “high”) can cause unconsciousness and death.

Liver and Kidney Damage

Small amounts of solvents repeatedly entering the bloodstream by way of the skin or lungs may cause internal damage, starting with the liver and kidney which are the first line of defense against unwanted chemicals in the blood. Some solvents cause cancer, birth defects or genetic damage. The harmful effects may take a long time to appear.

Nervous System Disorders

Many solvents adversely affect the central nervous system, act as narcotics or produce symptoms of drunkenness.

Allergies

Some people develop sensitivities—allergies—to certain solvents, such as formaldehyde and some petroleum distillates. Solvents causing allergies may also enhance a person’s sensitivity to additional chemicals. These sensitizers must be eliminated to reduce allergic response to other chemicals.

Additional Information

Assistance and Information

- Your county UW-Extension office.
- Wisconsin Department of Agriculture, Trade and Consumer Protection.
  Consumer Protection Division toll-free number, 1-800-362-3020.
- Wisconsin Department of Industry, Labor and Human Relations.
  Bureau of Plumbing, 608-266-3815.
  Occupational Safety Consultation, 608-266-1930.
- U.S. Consumer Product and Safety Commission toll-free number, 1-800-638-2772.
- To obtain information on a product you can also check the product label or your local library for the address and telephone number of the manufacturer. Call manufacturers for questions, complaints and information about their products.

Waste Disposal

—Local solid waste authority.
—District offices of the Wisconsin Department of Natural Resources (DNR) for information on hazardous waste disposal and any hazardous waste concerns.

Poison Information

You can contact Poison Centers about health effects of products and information about treating poisoning. Their telephone number appears on the inside cover of your telephone directory.

Other Sources of Information

- "Hazardous Waste from Homes," by John Lord, 1986. Available from Enterprise for Education, 1320A Santa Monica Mall, Santa Monica, CA 90401.
- "Hazardous Waste in Your Home. Here's What You Should Do!" Wisconsin DNR publication number WW-003 86 REV.
- "Household Pollutants Guide," by the Center for Science in the Public Interest, 1978. Anchor Press/Doubleday, 501 Franklin, Garden City, NY, 11530.
- "Indoor Air and Human Health," edited by Richard B. Gammage and Stephen V. Kayes (especially chapters by L. Wallace et al., C. Reed et al., D. Sterling, and L. Molhave). Lewis Publishers, Inc., 1987.
- "Toxicants in Consumer Products," (Report B of the Household Hazardous Waste Disposal "Project, Metro Toxicant Program #1) by Susan Ridgely, 1982. Available from David Galvin, Municipality of Metropolitan Seattle—Toxicant Control Planning Section, 821 2nd Ave., Seattle, WA 98104.

This is part of a three part series. Other UW-Extension publications in the series are G3026 *Pesticides—Chemical Hazards in the Home,* and G3028, *Household Cleaners and Polishes—Chemical Hazards in the Home.*

University of Wisconsin-Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914 Acts of Congress; and provides equal opportunities in employment and programming including Title IX requirements.

Elaine Andrews is a Cooperative Extension environmental education specialist at the Environmental Resources Center, College of Agricultural and Life Sciences. University of Wisconsin-Madison. Nitsa Benson wrote the original version of this brochure.

Produced by the Department of Agricultural Journalism, University of Wisconsin-Madison.

This publication is available from your Wisconsin county Extension office or from:
Agricultural Bulletin, Rm. 246
30 N. Murray St.
Madison, Wisconsin 53715
Phone 608-262-3346

Cooperative Extension System

Editors, before publicizing, contact Agricultural Bulletin to determine availability.

G3027 SOLVENTS—Chemical Hazards in the Home (1988)

R-01-89-5M.25-E