



## U.S. Consumer Product Safety Commission

### What You Should Know About Using Paint Strippers

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#### **IF NOT PROPERLY USED, PAINT STRIPPERS ARE HAZARDOUS TO YOUR HEALTH AND SAFETY.**

Paint strippers contain chemicals that loosen paint from surfaces. These chemicals can harm you or cause death if they are not used properly. Since many are absorbed readily through the skin or are inhaled easily, some paint stripping chemicals can irritate the skin and eyes or cause headaches, drowsiness, nausea, dizziness, or loss of coordination. Some chemicals may cause cancer, developmental or reproductive problems, or damage the liver, kidney, or brain. Others catch fire easily.

Adverse health effects in the developing fetus have been noted in laboratory animals exposed to some of the chemicals in paint strippers. Therefore, **women of child-bearing age** who work with or use paint strippers on a regular basis, such as at work, should take special precautionary measures to decrease their risk from dermal/or and inhalation exposure. These measures include use of appropriate gloves, increased ventilation, and limited work times when using paint strippers.

More consumers are choosing to complete do-it-yourself (DIY) projects in their homes. Using paint strippers in confined spaces, such as while refinishing bathtubs, can potentially expose you to dangerous chemicals through inhalation and dermal absorption. Proper handling of paint strippers will reduce your exposure to these chemicals and lessen your health risks.

#### **GENERAL SAFETY PRECAUTIONS**

Paint strippers contain different chemicals, and the **potential hazards are different for various products**. Each product has specific safety precautions (see the section below on paint stripper types). However, there are some general safety steps to keep in mind when using any paint stripper. If you use paint strippers frequently, it is particularly important that you follow these steps:

1. **Always read and follow the manufacturer's instructions and safety precautions on the label.** Do not assume you already know how to use the product. The hazards may be different

from one product to another, and the ingredients in individual products often change over time. The label tells you what actions you should take to reduce hazards and the first aid measures to use.

**2. Wear chemical-resistant gloves appropriate to the type of stripper being used.** Examples include gloves made with butyl rubber or neoprene. See the manufacturer's instructions or a material safety data sheet (MSDS) on your product to determine the appropriate glove type. Also, ask your local store what type of gloves to choose for your product. Common kitchen latex gloves do not provide enough protection. Replace gloves often to decrease dermal exposure risk.

**3. Avoid getting the paint stripper on your skin or in your eyes.** Wear protective clothing and goggles appropriate for the project and type of stripper.

**4. Use paint strippers outdoors, if possible.** If you must use them indoors, cross-ventilate by opening all doors and windows. Never use any paint stripper in a poorly ventilated area. Make sure there is fresh air movement throughout the room. Ventilate the area before, during, and after applying it and when stripping by using a fan that is blowing air away from you and to the outside. A fan is particularly important for nonflammable products that evaporate quickly, such as methylene chloride. However, electrical sparks from fans may increase the chance of flammable paint stripper fumes catching fire (see below). **If work must be done indoors under low ventilation conditions, consider having the work done professionally instead of attempting it yourself.**

**5. Do not use flammable paint strippers near any source of sparks, flame, or high heat.** Do not work near gas stoves, kerosene heaters, gas or electric water heaters, gas or electric clothes dryers, gas or electric furnaces, gas or electric space heaters, sanders, buffers, or other electric hand tools. Open flames, cigarettes, matches, lighters, pilot lights, or electric sparks can cause the chemicals in paint strippers to suddenly catch fire.

**7. Only strip paint with chemicals that are marketed as paint strippers.** Never use gasoline, lighter fluid, or kerosene to strip paint.

**8. Dispose of paint strippers according to the instructions on the label.** If you have any questions, ask your local environmental sanitation department about proper disposal.

## **TYPES OF PAINT STRIPPERS**

### **1. SOLVENT-BASED STRIPPERS**

Most paint strippers are solvent-based. Solvents dissolve the bond between wood and paint. Solvents also can dissolve other materials, including the latex or rubber of common household or dishwashing gloves. Some solvents will irritate or burn the skin, while some cause serious health effects even if contact does not immediately cause pain. In addition, many solvents evaporate quickly, and they can be easily inhaled. Inhalation of these solvents can produce health effects immediately or years after exposure.

It is especially important to use paint strippers that contain solvents either outdoors or in an indoor area with strong fresh air movement (e.g., with a fan). Some paint strippers contain

solvents that do not evaporate quickly. When using these strippers indoors, be sure to open windows and doors to provide fresh air movement in and out of the work site. You should always follow the manufacturer's instructions and safety precautions. Use the amount of stripper recommended by the manufacturer to avoid buildup of harmful fumes.

**The different types of solvent-based paint strippers and their potential hazards and safety precautions include:**

*A. Methylene chloride (also called dichloromethane, or DCM)*

Methylene chloride is the most commonly used chemical in paint strippers. Methylene chloride products come in two varieties: nonflammable and flammable. The flammable paint strippers have less methylene chloride than the nonflammable paint strippers, but they have other flammable chemicals, including acetone, toluene, or methanol.

Methylene chloride causes cancer in laboratory animals. The U.S. Environmental Protection Agency (EPA) and the U.S. Consumer Product Safety Commission (CPSC) consider methylene chloride to be a potential cause of cancer in humans. Methylene chloride evaporates quickly, and you can inhale it easily. Breathing high levels of methylene chloride over short periods of time can irritate the eyes, skin, nose, and lungs. It can also cause dizziness, headache, lack of coordination, and death in cases of high exposure and poor or no ventilation. High exposures to methylene chloride for long periods can also cause liver and kidney damage.

The human body can change some inhaled methylene chloride to carbon monoxide (CO). CO lowers the blood's ability to carry oxygen. This may cause problems for people with heart, lung, or blood disease who use methylene chloride paint strippers indoors without fresh air and cross-ventilation. Also, be aware that other potential sources of CO, such as smoking, vehicle exhaust, or generator use, may increase the amount of CO in the blood.

- Follow the manufacturer's instructions on how to use methylene chloride-based paint strippers.
- Ventilate the work area (e.g., with a fan) to reduce your exposure to methylene chloride vapors.
- Have a lot of fresh air when using methylene chloride paint strippers.
- Use methylene chloride paint strippers outdoors, if possible. If you must use them indoors, open all doors and windows and use a fan to move the fresh air in and out of the room.
- **If work must be done indoors under low ventilation conditions, consider having the work done professionally instead of attempting it yourself.**
- The safest place to use flammable methylene chloride strippers is outdoors away from any source of sparks, flame, or high heat. Electrical sparks from fans may increase the chance of flammable paint stripper fumes catching fire.

DIY use of methylene chloride-based paint strippers has increased, especially with bathtub refinishing. The Centers for Disease Control and Prevention (CDC) detailed a case report (<http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6107a2.htm>) on one fatality and Occupational Safety and Health Administration (OSHA) investigations on other worker deaths related to bathtub refinishing and methylene chloride use. The common findings in these deaths were improper ventilation and no or improper use of protective equipment, such as a respirator. It is important to follow the manufacturer's instructions and the recommendations of this booklet to decrease exposure to methylene chloride in paint strippers and lessen your health risk.

### *B. Acetone, toluene, and methanol*

Acetone, toluene, and methanol are chemicals that are commonly used together in paint strippers, and they evaporate quickly and are very flammable. Breathing high levels of these chemicals can cause a variety of effects, including drowsiness, dizziness, and headache. Breathing high levels of toluene may harm unborn children, and breathing very high levels for a long period may cause brain damage. Toluene and methanol are poisonous if swallowed.

- To avoid fire and health problems, use products that contain these chemicals only in areas with plenty of fresh air.
- Do not work near an open flame, pilot lights, or electrical sparks when using flammable paint strippers. Do not use strippers near gas stoves, kerosene heaters, gas or electric water heaters, gas or electric clothes dryers, gas or electric furnaces, gas or electric space heaters, sanders, buffers, or other electric hand tools.

### *C. N-methylpyrrolidone (NMP)*

Excessive contact with NMP may cause skin swelling, blistering, and burns. These skin reactions may not appear until sometime after exposure. NMP is readily absorbed through the skin and may cause health problems. Adverse health effects in the developing fetus have been noted in laboratory animals exposed to some of the chemicals in paint strippers. Therefore, **women of child-bearing age** who work with or use paint strippers on a regular basis, such as at work, should take special precautionary measures to decrease their risk from dermal/or and inhalation exposure.

- Wear chemical-resistant gloves and protective clothing (e.g., long sleeves and pants) to avoid skin contact when using this solvent.
- Wash hands immediately after use, even when wearing gloves.
- Gloves should fit properly and be chemical-resistant. Examples include gloves made with butyl rubber or neoprene. **See the manufacturer's instructions or a MSDS on your product to determine the appropriate glove type. Also, ask your local store about which gloves to choose for your product.** Common kitchen latex gloves do not provide enough protection.

- Avoid using this product in an enclosed area for extended periods of time without open doors or windows, and ventilate with a fan for cross-ventilation.

*D. Dibasic esters (DBE), including dimethyl adipate ester, dimethyl succinate ester, and dimethyl glutarate ester*

Much less is known about the possible health effects of dibasic esters (DBE), including dimethyl adipate ester, dimethyl succinate ester, and dimethyl glutarate ester in paint strippers. Some people using DBE products without fresh air have reported temporary blurred vision. Repeatedly breathing DBE damages the cells lining the nose of laboratory animals. Some strippers include a mixture of DBE products and NMP.

- Avoid using this product for extended periods of time in an enclosed area without open doors or windows, and ventilate the area with a fan for cross-ventilation.
- Use appropriate protective clothing and eye protection when using these products.

## **2. CAUSTIC-BASED STRIPPERS (NOT FLAMMABLE)**

*A. Caustic alkalis*

Caustic alkalis react with the paint coating and loosen it from the surface. One of the chemicals in this type of stripper is sodium hydroxide (lye). Some people do not use caustic alkalis because caustic products can darken wood and raise the grain. Caustic alkalis can cause severe burns to skin and eyes even with short contact. Therefore, be very careful to keep caustic chemicals away from skin and eyes, and wear protective clothing. If contact occurs, wash them off immediately with cold water. Caustic alkalis are also highly toxic if swallowed.

- Avoid skin and eye contact when using caustic alkalis.
- Use gloves that fit properly and are appropriate for caustic alkalis.
- Wear appropriate protective clothing and goggles when using caustic alkalis.

## **3. OTHER TYPES OF PAINT STRIPPERS**

Some paint strippers have a citrus smell or make "environmentally friendly" claims. However, these paint strippers may also be hazardous, despite these claims, and they may contain NMP or DBE.

- Use appropriate protective clothing, protective eye covering, and fresh air for cross-ventilation even when using these types of paint strippers.
  - Check the labels or the product's MSDS sheet for the ingredient list to determine specific protective measures to be taken, such as respiratory, eye, or skin protection.
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For more information on indoor air quality, contact:

U.S. Environmental Protection Agency  
Indoor Air Quality Information clearinghouse  
800-438-4318  
<http://www.epa.gov/iaq/>  
EPA 747-F-95-002

U.S. Consumer Product Safety Commission (CPSC)  
800-638-2772  
<http://www.cpsc.gov/en/Safety-Education/Safety-Guides/Home-Appliances-Maintenance-and-Structure/Indoor-Air-Quality-Publications/>  
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This revision of the paint stripper booklet reflects the opinions of the CPSC staff and has not been reviewed and/or approved by, and may not necessarily reflect the views of, the Commission.