

Dry Cleaners: 1-bromopropane (1-BP) can seriously harm workers

How does 1-BP harm workers?

1-BP liquid releases highly-flammable vapor that is also irritating to exposed skin, eyes and the respiratory system. Repeated skin contact with 1-BP liquid dries out skin and can cause a serious rash (dermatitis).

Breathing vapor or absorbing 1-BP from skin contact may cause workers to feel lightheaded or get a headache. 1-BP exposure can damage the nerves in the arms, legs and body. This damage can cause temporary or permanent muscle weakness, twitching, tremors, loss of feeling or other serious symptoms.

Some evidence shows that 1-BP can be toxic to the liver and reproductive system and may cause cancer.

How do workers get exposed to 1-BP?

Vapor may leak through machinery door gaskets, duct work and other parts of the system while machines are closed and operating. Leaks are often related to aging, poorly maintained equipment or improperly “converted” machines.

Poor workplace ventilation allows vapor from leaks to concentrate around machinery and spread throughout the shop exposing machine operators, press operators and even front-counter workers. Vapor can also accumulate around open or unsealed containers of solvent or waste, especially in cramped or hot work areas.

Opening the door to the machine before the drying cycle has completed lets vapor escape into the work area. **Leaning into the drum** to retrieve clothing also exposes workers.

Cleaning muck from filters or sludge from stills or spills without proper safety equipment, and ventilation exposes workers to very high levels of 1-BP. Refilling tanks can expose workers’ eyes and skin to possible splashes of 1-BP liquid.

Current exposure limits recommended for 1-BP are a little as 5 ppm for an 8-hour work-shift. Testing done in several dry cleaning businesses has shown workers can breathe harmful amounts of 1-BP.



Without proper safety training and precautions, 1-BP can threaten the health of machine operators, press workers and even front-counter workers.

Photo courtesy of CDC/NIOSH.

Safety tips for dry cleaner owners and workers:

- Use a qualified technician to convert “perc” machines. This minimizes leaks by ensuring the right parts and materials are used and correctly installed.
- Regularly inspect machines to find and fix leaks.
- Always turn on the general ventilation system before operating machines.
- Use a long-handled tool to retrieve clothing from the back of the drum. Keep your head out of and facing away from the drum.
- Don’t cut drying times short.
- Don’t “cook” 1-BP.
- Read the product label and safety data sheet (SDS) to get hazard and safety recommendations. Another name for 1-BP is **n-propyl bromide**.

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How do I keep workers safe?

If you are thinking about switching to 1-BP, consider using other solvents and processes that are safer. An investment in safer alternatives may pay off in terms of fewer costly injuries and illnesses and less regulatory burdens.

Improved ventilation and work practices are the best ways to reduce 1-BP exposures. Open windows and doors do not provide enough or reliable ventilation. Effective ventilation solutions include an operating HVAC system, a local exhaust ventilation system, and large portable fans paired with a wall-mounted exhaust fan.

Written safe work procedures for each job can help minimize exposure during routine or infrequent tasks. Address job tasks with the highest exposure first and seek safer ways to do the task. Look through the operations manual for your machine to identify what workers should do or not do. Use warning information on the safety data sheet (SDS) and other literature for the 1-BP product you use.

Personal protective equipment (PPE) such as gloves, safety goggles and respirators are needed. After you do a required PPE assessment to identify what job tasks warrant PPE, then you must provide the right gear, ensure it fits the worker, is correctly and consistently worn, and is properly maintained or disposed of.

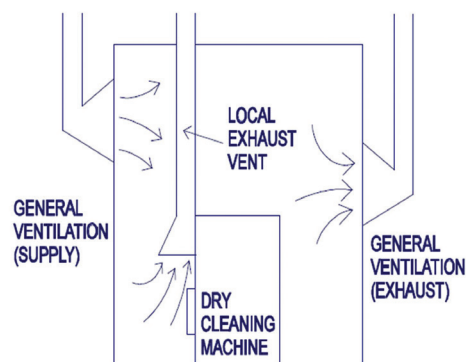
Train employees to ensure they understand the hazards and how to work safely with 1-BP in your shop. You are obligated to address this in your required written Hazard Communication Program.

For more information, please see the Dry Cleaning resource page on the L&I website: www.Lni.wa.gov/Safety/Topics/AtoZ.

To find an **electronic** copy of this Hazard Alert with active links to the following resources, go to www.Lni.wa.gov/Safety/Basics/HazAlerts.

More safety tips:

- Wear the right gloves and eye (or face) protection every time you pour or handle 1-BP liquid and waste soaked with 1-BP. **“Viton”** and **“Silvershield”** gloves provide best protection.
- In addition to other PPE, use NIOSH-approved respirators equipped with organic vapor cartridges when raking stills or doing other tasks with high exposure.
- Prevent fires by storing 1-BP away from sparks, open flames and chemicals that are strong oxidizers or strong bases (read each product’s SDS and label to learn more about safe storage).
- Give workers this alert and tell them to report any symptoms to their supervisor and doctor.



For better ventilation: the direction of air flow should move from a clean area (customer counter) to one that’s less clean (machine area) where vapor is captured and vented outdoors by local exhaust and a wall-mounted exhaust fan.

Photo courtesy of CDC/NIOSH.

How can I get help from L&I?

The Department of Labor & Industries provides consultations, training, and technical assistance at no cost to employers. Call today to schedule a free confidential consultation or go to www.SafetyConsultants.Lni.wa.gov for more information.

You may also call 1-800-423-7233 or visit a local L&I office and ask for the Consultation Manager.

*This alert was developed by L&I’s Division of Occupational Safety and Health (DOSHS) to alert employers, labor groups, and employees to potential hazards associated with work activities. **This is not a rule and creates no new legal obligations.** The information provided includes suggested guidance on how to avoid workplace hazards and describes relevant mandatory safety and health rules. DOSHS recommends you also check the related rules for additional requirements.*