

Indoor air quality: Volatile organic compounds (VOCs)

What are volatile organic compounds (VOCs)?

Volatile organic compounds (VOCs) are gases that are given off by many indoor sources. They contribute to air pollution within enclosed spaces. Concentrations of most VOCs are higher in indoor air than outdoor air. These gases at high levels can impact both indoor air quality and human health.

Where do VOCs come from?

Many products commonly found in our homes release VOCs through off gassing. For example, formaldehyde, one of the most common VOCs, is a colourless gas with an acrid (sharp and bitter) smell. It is common in many building materials such as plywood, particleboard and glues. Formaldehyde can also be found in some drapes and fabrics, and in certain types of foam insulation.

Other indoor sources of VOCs include:

- The burning of fuels such as natural gas, wood and kerosene
- Tobacco products
- Personal care products such as perfume and hair spray
- Candles and incense
- Cleaning agents and air fresheners
- Dry cleaning fluid
- Paints, lacquers, varnishes and hobby supplies
- Copying and printing machines
- Vehicle exhaust infiltrating from attached garages

VOCs can be released from products during use and even in storage. However, the amounts of VOCs emitted from products tend to decrease as the product ages.

What are some health concerns caused by VOCs?

The health effects caused by VOCs depend on the concentration and length of exposure to the chemicals. VOCs include a variety of chemicals that can cause immediate symptoms including:

- Eye, nose and throat irritation
- Shortness of breath
- Headaches
- Fatigue
- Nausea
- Dizziness
- Skin problems

Higher concentrations may cause:

- Lung irritation
- Damage to the liver, kidneys or central nervous system

Long-term exposure may also cause damage to the liver, kidneys, or central nervous system. Some VOCs are suspected of causing cancer and some have been shown to cause cancer in humans.

Most people are not affected by short-term exposure to the low levels of VOCs found in homes. Some people may be more sensitive, such as people with asthma. For long-term exposure to low levels of VOCs, research is ongoing to better understand any health effects from these exposures.

How can I avoid exposure to VOCs?

The best way to avoid exposure to VOCs is by controlling their source:

- Use materials and products that do not give off VOCs
- Some building products give off fewer VOCs than others. Select paints and varnishes that are labelled as containing low VOCs
- Do not allow smoking in or near your home. Second-hand smoke contains many pollutants, including VOCs
- Minimize use of scented products such as plug-in or aerosol deodorizers, candles and incense
- Consider storing new furnishings and building materials for at least a few weeks before using. This will allow gases to be given off before you bring them into your home. If this is not possible, increase the ventilation by opening windows and doors in your home for a few weeks
- Buy only enough paints, cleaners and solvents that you need for immediate use, so you don't have to store them in your home. Follow instructions on the product label. Keep lids on tightly. Store products in a separate room like an outdoor shed or in areas with proper ventilation
- Remove old or unnecessary tins or bottles that contain products with VOCs from the home. Do not throw unused products away with your household garbage. Ensure you safely and properly dispose of them. Contact your local municipality or RCBC (Recycling Council of British Columbia) at <https://rcbc.ca> for more information
- Avoid bringing recently dry-cleaned clothing

into your home if it still has a strong smell. Leave the clothing at the shop or take it out of the plastic wrapping and hang it in a ventilated area until it is dry

New carpets:

- If glues are necessary, select those suitable for indoor use
- Leave the area during carpet installation
- Ventilate the area as much as possible during the installation using fans and opening windows and doors. Continue to ventilate for several days after installation

Ventilation:

- Make sure you get enough fresh, clean air into your home by opening windows
- Increase ventilation by opening windows and doors after you bring new VOC sources into your house, such as new carpets, furniture or drapes
- Follow manufacturers' labels when using household chemicals. If the label says "use in a well-ventilated area", go outside or to an area where an exhaust fan or open window provides extra ventilation

For more information

- Health Canada: Air quality and health www.canada.ca/en/health-canada/services/air-quality.html
- Health Canada: Volatile organic compounds www.canada.ca/en/health-canada/services/air-quality/indoor-air-contaminants/volatile-organic-compounds.html
- The B.C. Lung Foundation: Air Quality [https://bclung.ca/lung-health/air-quality](http://bclung.ca/lung-health/air-quality) or call toll-free 1-800-665-LUNG (5864)



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