

Volatile Organic Compounds (VOCs) in Indoor Air

VOC's are a large group of chemicals that are found in many products we use to build and maintain our homes. Once these chemicals are in our homes, they are released or "off-gas" into the indoor air we breathe. Some of these chemicals have an odor, but smelling is not a good indicator of health risk.

Common examples of VOCs that may be present in our daily lives are: benzene, ethylene glycol, formaldehyde, methylene chloride, tetrachloroethylene, toluene, xylene and 1,3-butadiene.

Sources of VOCs

Building Materials	Home & Personal Care Products	Activities & Hobbies
<ul style="list-style-type: none"> • Paints, varnishes, caulks, adhesives • Carpet, vinyl flooring • Composite wood • Upholstery & foam 	<ul style="list-style-type: none"> • Air fresheners, cosmetics • Cleaning products • Fuel oil, gasoline 	<ul style="list-style-type: none"> • Smoking • Dry cleaning, photocopiers • Cooking • Burning wood

Health effects of VOC exposure

The risk of health effects from inhaling any chemical depends on how much is in the air, how long and how often a person breathes it in. Breathing low levels of VOCs for long periods of time may increase some people's risk of health problems. Several studies suggest that exposure to VOC's may make symptoms worse for people with asthma or who are particularly sensitive to chemicals. *These are much different exposure than occupational exposures.*

It is important to remember that VOCs refer to a group of chemicals. Each chemical has its own toxicity and potential for health effects.

Common symptoms of exposure to high levels of VOCs include:

Acute/Short-term Exposures (hours to days)	Chronic Exposures (years to a lifetime)
<ul style="list-style-type: none"> • Eye, nose, throat irritation • Headaches • Nausea/vomiting • Dizziness • Worsening of asthma symptoms 	<ul style="list-style-type: none"> • Cancer • Liver & kidney damage • Central nervous symptom damage

What is a safe level of VOCs?

To protect your health, it is best to limit your exposure to products and materials that contain VOCs. If you think you may be having health problems caused by VOCs, try reducing levels in your home. If symptoms persist, consult with your doctor to rule out serious health conditions that may have similar symptoms.

Most health related studies have been conducted on single chemicals. Less is known about the health effects of exposure to combinations of chemicals. Because the toxicity of VOCs varies for each individual chemical, there is no Minnesota or federal health-based standard for VOCs as a group.

How do I reduce the levels of VOCs in my home?

Conduct an inspection of your home for common sources of VOCs. Look for supplies of unused chemicals such as paints, varnishes, solvents, adhesives and caulks. Household furnishing like carpet, upholstered furniture or items made from composite wood tend to off-gas more when they are new.

- **Source Control:** Remove or reduce the products in your home that give off VOCs.
 - Buy only what you need when it comes to paints, solvents and adhesives. Unused chemicals stored in the home can sometimes “leak” and release VOCs in the air.
 - Store unused chemicals in a garage or shed when people do not spend time.
 - Dispose of unused chemicals that are stored in your home or garage. Check with your city or county for household hazardous waste collection sites.
 - Consider purchasing low-VOC options of paint and furnishing.
- **Ventilation and Climate Control:** Increasing the amount of fresh air in your home with help reduce the concentration of VOCs indoors.
 - Open doors and windows, and use fans to maximize air brought in from the outside.
 - Keep both the temperature and relative humidity as low as possible or comfortable. Chemicals off-gas more in high temperatures and humidity.
 - Try to perform home renovations during the seasons that allow you to open door and windows to increase ventilation.

Should I test my home for VOCs?

There are no federal or state standards for VOC levels in non-industrial settings. If you are concerned about VOCs, it is best to try and reduce or eliminate the products that bring VOCs into your home.

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