Volatile Organic Compounds (VOCs)

Volatile organic compounds change easily from liquid form to vapor.

What are volatile organic compounds (VOCs)?

Organic compounds are chemicals that contain carbon and are found in all living things. Volatile organic compounds, sometimes referred to as VOCs, are organic compounds that easily become vapors or gases. Along with carbon, they contain elements such as hydrogen, oxygen, fluorine, chlorine, bromine, sulfur or nitrogen.

Volatile organic compounds are released from burning fuel, such as gasoline, wood, coal, or natural gas. They are also emitted from oil and gas fields and diesel exhaust. They are also released from solvents, paints, glues, and other products that are used and stored at home and at work.

Many volatile organic compounds are also hazardous air pollutants. Volatile organic compounds, when combined with nitrogen oxides, react to form ground-level ozone, or smog, which contributes to climate change.

Examples of volatile organic compounds are gasoline, benzene, formaldehyde, solvents such as toluene and xylene,styrene, and perchloroethylene (or tetrachloroethylene), the main solvent used in dry cleaning.

Many volatile organic compounds are commonly used in paint thinners, lacquer thinners, moth repellents, air fresheners, hobby supplies, wood preservatives, aerosol sprays, degreasers, automotive products, and dry cleaning fluids.

How might I be exposed to volatile organic compounds?

Volatile organic compounds are common air pollutants found in most of the air in the United States. You can be exposed to volatile organic compounds outdoors by breathing polluted air that contains them. You are most likely to be exposed to volatile organic compounds outdoors in the summer, when the sun and hot temperatures react with pollution to form smog, causing government officials to issue air quality alerts.

Indoors, products that contain volatile organic compounds release emissions when you use them, and to a smaller degree, when they are stored. You can be exposed to volatile organic compounds at home if you use cleaning, painting, or hobby supplies that contain them. You can also be exposed if you dry clean your clothes with home dry-cleaning products; if you dry-clean your clothes at a professional dry-cleaners; or if you use graphics and crafts materials such as glues, permanent markers, and photographic solutions.

At work, you can be exposed to volatile organic compounds if you work at a dry cleaner, a photography studio, or an office that uses copiers, printers, or correction fluids. You can also be exposed if you work in chemical manufacturing or with petroleum-based products.

How can volatile organic compounds affect my health?

The health effects of volatile organic compounds can vary greatly according to the compound, which can range from being highly toxic to having no known health effects. The health effects of volatile organic compounds will depend on the nature of the volatile organic compound, the level of exposure, and the length of exposure.

Benzene and formaldehyde are listed as human carcinogens in the Fourteenth Report on Carcinogens published by the National Toxicology Program; diesel exhaust particulates, perchloroethylene, and styrene are listed as "reasonably

anticipated to be human carcinogens." People at the highest risk of long-term exposure to these three volatile organic compounds are industrial workers who have prolonged exposure to the compounds in the workplace; cigarette smokers; and people who have prolonged exposure to emissions from heavy motor vehicle traffic.

Long-term exposure to volatile organic compounds can cause damage to the liver, kidneys, and central nervous system. Short-term exposure to volatile organic compounds can cause eye and respiratory tract irritation, headaches, dizziness, visual disorders, fatigue, loss of coordination, allergic skin reactions, nausea, and memory impairment.

If you think you have been exposed to benzene, formaldehyde, toluene, or perchloroethylene, contact your health care professional.

For poisoning emergencies or questions about possible poisons, please contact your local poison control center at 1-800-222-1222.

This description is based on the information found in the Web links listed with this topic.

Web Links from MedlinePlus (National Library of Medicine)

Air Pollution
Inhalants

More Links

Map of Superfund Hazardous Waste Sites with Volatile Organic Compounds in the United States. TOXMAP (National Library of Medicine)
Volatile Organic Compounds in Drinking Water (New Jersey Department of Health) (PDF — 658 KB)
Volatile Organic Compounds in the Nation's Groundwater and Drinking-Water Supply Wells - A Summary (US Geological Survey) (PDF — 181.36 KB)
Volatile Organic Compounds in Your Home (Minnesota Department of Health)
Volatile Organic Compounds' Impact on Indoor Air Quality (Environmental Protection Agency)

Locations where Volatile Organic Compounds may be found: more neighborhoods >>

City	Farm	Town
Airplanes and Air Travel	Agricultural Runoff	Auto Shop
Brownfield	Barn and Silo	Climate Change
Climate Change	Climate Change	Drinking Water
Construction	Drinking Water	Factory
Dental Office and Lab	Farm Pond	Homes
Drinking Water	Feeding Operation	Indoor Air
Factory	Homes	Offices and Stores
Funeral Home	Hydraulic Fracturing	Outdoor Air
Hair and Nail Salons	Indoor Air	Park
Homes	Landfill	River
Hospital	Meat Processing	School
Indoor Air	Off-road Vehicles	School Bus
Offices and Stores	Outdoor Air	Vehicles
Outdoor Air	Shed	

Locations where Volatile Organic Compounds may be found: more neighborhoods >>		
Park River School School Bus Vehicles	Vehicles	
		<< previous neighborhoods
Port Beach Climate Change Coastal Brownfield Cruise Ship Drinking Water Fish Farm Fuel Pipelines Homes Indoor Air Marina and Boats Offices and Stores Outdoor Air River Shipping Shipyard Storms and Floods Stormwater and Sewage Urban and Industrial Runoff Vehicles	**US Southwest** Agricultural Runoff Airplanes and Air Travel Climate Change Coal-Fired Power Plants Drinking Water Homes Hydraulic Fracturing Illegal Dumps and Tire Piles Indoor Air Off-road Vehicles Oil and Gas Fields Outdoor Air River Trash Burning Vehicles Wildfires	