

# **What You Need To Know About Vinyl Chloride (VC)**

## **What is Vinyl Chloride?**

Vinyl chloride (VC) is a volatile organic compound, meaning that it can become a gas in certain conditions. At low temperatures, or under high pressure, vinyl chloride is a liquid. However, at room temperature it is a colorless gas with a faint, sweet odor that burns easily. While VC is a manufactured gas, it can also be formed when other manufactured substances, such as trichloroethylene, trichloroethane, and tetrachloroethylene, are broken down by microorganisms.

## **What is Vinyl Chloride Used for?**

A majority of the vinyl chloride in the United States is used to produce polyvinyl chloride (PVC). PVC is used to manufacture a variety of plastic and vinyl products including pipes, and wire and cable coatings.

However, vinyl chloride is also used to produce:

- Furniture and Automobile Upholstery
- Wall Coverings
- Housewares
- Automotive Parts
- Packaging Materials
- Glass
- Medical Supplies

In the past, vinyl chloride was also used as a refrigerant. Vinyl chloride is also produced in tobacco smoke.

## **How Might I be Exposed to Vinyl Chloride?**

Since vinyl chloride is a gas, you are most likely to be exposed by breathing it in. Individuals who work in facilities that manufacture VC or PVC are exposed to higher levels of VC than the general population. However, vinyl chloride has also been discovered in the air near VC manufacturing and processing plants, hazardous waste sites and some landfills.

If you live near a facility like this, you may be exposed to VC by drinking water or showering in water from a private well that drills down directly into a

groundwater source that has been contaminated with vinyl chloride. It is important to note that, because VC is a degradation product of TCE, vinyl chloride can be found in groundwater and soil that was originally contaminated with TCE. You may also be exposed to vinyl chloride in your drinking water, because of vinyl chloride leached from contact with polyvinyl pipes.

Additionally, you may be exposed to vinyl chloride in the air. Because vinyl chloride is a volatile organic compound, VC in groundwater can turn into a gas, rise up through the soil and slip through tiny foundation cracks into your home, exposing you to VC in the air that you breathe. You can also be exposed to VC through tobacco smoke from cigarettes and cigars, whether it be from actively smoking or exposure to second-hand smoke.

### **What Happens to Vinyl Chloride in the Environment?**

Vinyl chloride enters the environment at manufacturing plants or landfills because of improper disposal. It can also be formed as a result of other chemicals breaking down over time. Vinyl chloride evaporates easily in air, however, it can also migrate through soil into groundwater where it degrades slowly.

### **How Can Vinyl Chloride affect my Health?**

First of all, you need to know there is ***no safe level of vinyl chloride***. The International Agency for Research on Cancer (IARC), a division of the World Health Organization (WHO), has classified VC as a known human carcinogen. Additionally, both the United States Department of Health and Human Services (DHHS) and the Environmental Protection Agency (EPA) have classified VC as a known carcinogen.

VC exposure has been linked to an increased risk of various types of cancers including:

- Hepatic Angiosarcoma, a rare form of liver cancer;
- Brain Cancer
- Liver Cancer
- Lung Cancer
- Lymphoma
- Leukemia.

- Soft Tissue Sarcoma

The primary target of VC toxicity is the central nervous system, however, there are several other health effects from vinyl chloride exposure including:

- Vinyl Chloride Disease which includes:
  - Raynaud's Phenomenon: impaired blood flow to the hands
  - Changes in bone structure at end of the fingers
  - Scleroderma: Skin changes (thickening of skin, decreased elasticity, edema)
  - Joint and muscle pain
- Liver damage
- Nerve damage
- Immune reactions
- Skin irritation
- Dizziness
- Fatigue
- Headaches
- Eye and upper respiratory tract irritation
- Irritability
- Respiratory depression
- Loss of consciousness
- Visual and auditory disturbances
- Disorientation
- Nausea
- Vomiting
- Diarrhea
- Epigastric pain
- Burning or tingling of extremities
- Memory loss
- Ataxia
- Reactive Airway Dysfunction
- Hydrocarbon Pneumonitis in children
- Sleep disorders
- Neurological or behavioral symptoms

- Male infertility and reduced libido
- Death

### **Is There a Medical Test That Shows if I Have Been Exposed to Vinyl Chloride?**

Vinyl chloride can be measured in urine and breath, but these tests must be done shortly after exposure and are not reliable indicators of total exposure to VC. Moreover, they are not readily available in a doctor's office.

### **How Can I Reduce My Family's Risk of Exposure to Vinyl Chloride?**

1. Get your private well tested.
2. Avoid drinking water from contaminated sources. Drink bottled water until a solution is reached. Limit showers and baths or use bottled water.
3. Demand the polluter connect your family to a clean water source.
4. Prevent children from playing in the dirt if you live near a site contaminated with vinyl chloride
5. Drink only from plastic bottles that are PVC free.
6. Avoid cigarette and cigar smoke.
7. Test the air inside your home.
8. Seal sump pumps and foundation cracks and increase ventilation in your home.
9. Demand the polluter install a vapor mitigation system to get rid of the toxic vapors, if necessary.
10. Demand that the polluter clean up the contaminated groundwater.
11. Most importantly demand that the polluter clean up the contamination on their property.
12. Contact an experience environmental lawyer to help you with each of these steps.

### **What Should I Do if I'm Concerned My Health May be Affected?**

See your family doctor or an occupational doctor familiar with chemical exposure. Let them know if you have been exposed to vinyl chloride and bring any VC test results.

**Vinyl Chloride Can also be Labeled as:**

Chloroethene; Chloroethylene; Monochloroethylene; Vinyl chloride monomer; Vinyl C monomer; C<sub>2</sub>H<sub>3</sub>Cl; Ethylene monochloride; Monochloroethene; Chlorethene; Chlorethylene; Chlorure de vinyle; Cloruro di vinile; Rcra waste number U043; Trovidur; UN 1086; VC; VCM; Vinylchlorid; Vinyle(chlorure de); Winylu chlorek.

**Links:**

<https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/vinyl-chloride>

<https://www.epa.gov/sites/production/files/2016-09/documents/vinyl-chloride.pdf>

<https://www.atsdr.cdc.gov/PHS/PHS.asp?id=280&tid=51#bookmark05>

<https://www.atsdr.cdc.gov/toxfaqs/tfacts20.pdf>

<https://www.atsdr.cdc.gov/MMG/MMG.asp?id=278&tid=51>

<http://webbook.nist.gov/cgi/cbook.cgi?ID=C75014&Mask=1>

<https://www.atsdr.cdc.gov/toxguides/toxguide-20.pdf>

