

# **What You Need to Know About Perchloroethylene (PCE)**

## **What is PCE?**

PCE is a manufactured chemical used mostly as a cleaning agent. PCE is a colorless, nonflammable liquid with a sweet, ether-like odor. It is also a volatile organic compound, which means it can turn into a gas.

## **What is PCE Used for?**

PCE is used primarily for metal degreasing and for dry cleaning, scouring, and sizing fabrics. PCE is also used to make other chemicals (specifically Chlorofluorocarbons) and as an insulating fluid in electrical transformers.

Furthermore, PCE is also an ingredient in several products including:

- Aerosols
- Solvent Soaps
- Printing Inks
- Adhesives
- Glues
- Sealants
- Paint Removers
- Paper Coatings
- Rubber Coatings
- Water Repellent
- Leather Treatments
- Automotive Cleaners
- Polishes
- Lubricants
- Silicones
- Typewriter Correction Fluid
- Textile processing
- Spot Removers
- Wood Cleaners
- Shoe Polish

## **How Might I be Exposed to PCE?**

Exposure to PCE primarily occurs in industries--like dry cleaning, chemical production, metal degreasing, rubber coating or textile facilities-- that manufacture or use the chemical, either by breathing contaminated air or by contact with your skin. In addition, despite newer dry cleaning technologies that reduce occupational exposure to PCE, the major source of PCE contamination in groundwater is still discharge from dry cleaners and factories. If you live near this type of facility or near a hazardous waste site containing PCE, you may be exposed by drinking water from a private well that is drilled down into the contaminated groundwater. Inhaling PCE vapors while bathing or showering with contaminated water is another way to get exposed to PCE. You may also be exposed by coming into contact with contaminated soil or by breathing air in your home that has been contaminated by vapor intrusion. In this process, toxic vapors rise up from the contaminated groundwater, through the soil and into your home through tiny cracks in the foundation.

## **What Happens to Perchloroethylene in the Environment?**

In air, PCE breaks down very slowly, and as a result, can travel a long distance. It does not easily degrade in soil either, but over time, can break down into other chemicals such as vinyl chloride. In groundwater or soil, it can also volatilize into a gas and enter buildings through tiny cracks in the foundation.

## **How Can PCE Affect My Health?**

The United States Environmental Protection Agency (US EPA) has classified PCE as “likely to be carcinogenic to humans” based on sufficient evidence of carcinogenicity in animals and suggestive evidence in humans. The International Agency for Research on Cancer (IARC), a division of the World Health Organization (WHO) has also concluded that PCE is “probably carcinogenic to humans” based on similar evidence.

Studies have revealed a correlation between PCE exposure and various types of cancers, including:

- Bladder cancer
- Non-Hodgkin’s lymphoma
- Multiple myeloma

- Leukemia
- Rectal cancer
- Lung cancer
- Esophageal cancer
- Kidney cancer
- Cervical cancer
- Breast cancer
- Liver cancer
- Ovarian cancer
- Prostate cancer

In addition, PCE toxicity targets the central nervous system, kidney, liver and reproductive system. Individuals who have a disease of the heart, liver, kidneys or lungs are most susceptible to the negative health effects associated with PCE exposure. Reported health problems in people exposed to PCE include:

- Parkinson's disease
- Hodgkin's disease
- Impaired immune system function
- End-stage renal disease
- Scleroderma
- Ventricular arrhythmia
- Cardiomyopathy
- Hepatitis
- Cirrhosis
- Abnormal liver function and liver cell necrosis

PCE exposure is especially dangerous for pregnant women, as the following health effects have been reported in children who were exposed in utero:

- Low birth weight
- Fetal death
- Major heart defects
- Neural tube defects
- Oral cleft defects
- Chonal atresia (nasal passages blocked with tissue or bone)

- Eye defects
- Miscarriage
- Leukemia

Symptoms of PCE Exposure includes:

- Loss of coordination
- Eye irritation
- Skin irritation (redness, blistering, and/or scaling)
- Respiratory irritation
- Shortness of breath
- Buildup of fluid in the lungs
- Sweating
- Nausea
- Vomiting
- Headache
- Dizziness
- Drowsiness
- Cough
- Sleep disturbances
- Memory loss
- Irritability
- Slurred speech
- Confusion
- Difficulty speaking and/or walking
- Lightheadedness
- Kidney dysfunction
- Liver damage
- Mood and behavior changes
- Color vision deficits
- Attention problems
- Impaired coordination
- Respiratory arrest
- Cardiac dysrhythmia
- Unconsciousness

- Death

### **Is there a Medical Test That Shows Whether I Have Been Exposed to PCE?**

PCE can be measured in breath. Because it is stored in the body's fat and slowly released into the bloodstream, PCE can be detected for weeks following heavy exposure. Breakdown products of PCE can be measured in blood and urine, however, because exposure to other chemicals can produce the same breakdown products, these tests are not conclusive.

### **How Can I Reduce my Family's Risk of Exposure to PCE?**

1. Use consumer products containing PCE in well ventilated areas. When not in use, these products should be tightly covered and out of the reach of children.
2. Get your private well water and the air inside your home tested.
3. Avoid drinking water from contaminated sources. Drink bottled water until a solution can be reached. Limit showers and baths or use bottled water.
4. Demand the polluter connect your family to a clean water source.
5. Prevent children from playing in the dirt if you live near a PCE contaminated site.
6. Seal sump pumps and foundation cracks and increase the ventilation in your home.
7. If necessary, demand the polluter install a vapor mitigation system to get rid of toxic vapors.
8. Demand the polluter clean up the contaminated site.
9. Contact an experienced 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 you have been exposed to PCE and bring any PCE test results with you.

### **PCE Can Also Be Labeled As:**

\_Ankilostin; Antisal 1; Didakene; Ethylene tetrachloride; Fedal-Un; Nema; Perchlorethylene; Perchloroethylene; Perclene; PerSec; Tetlen; Tetracap; Tetrachlorethylene; Tetrachloroethene; Tetraguer; Tetraleno; Tetropil; 1,1,2,2-Tetrachloroethylene; C2Cl4; Carbon bichloride; Carbon dichloride; Czterochloroetylen; ENT 1,860; Nema, veterinary; NCI-C04580; Perawin; Perchloorethyleen, per; Perchloraethylen, per; Perchlorethylene, per; Percloroetilene; PERC; Tetrachlooretheen; Tetrachloraethen; Tetracloroetene; Tetralex; Antisol 1; Dow-per; Perchlor; Perclene D; Percosolve; PERK; PERC; Perklone; RCRA Waste Number U210; Tetravec; Tetroguer; UN 1897; Dilatin PT; 1,1,2,2-Tetrachloroethene; Freon 1110; Perclene TG; Perchloroethene; F 1110.

**Links:**

[https://www.toxtown.nlm.nih.gov/text\\_version/chemicals.php?id=22](https://www.toxtown.nlm.nih.gov/text_version/chemicals.php?id=22)

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

<https://www.atsdr.cdc.gov/csem/csem.asp?csem=14&po=10>

<https://www.atsdr.cdc.gov/MMG/MMG.asp?id=261&tid=48>

<https://www.atsdr.cdc.gov/toxguides/toxguide-18.pdf>

<https://semspub.epa.gov/work/05/917564.pdf>

<https://pubchem.ncbi.nlm.nih.gov/compound/tetrachloroethylene#section=Top>

<http://webbook.nist.gov/cgi/cbook.cgi?ID=C127184&Mask=4&Type=ANTOINE&Plot=on>