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Chemicals in the Environment



- What is perchloroethylene, how is it used, and how might I be exposed?
- What happens to perchloroethylene in the environment?
- How does perchloroethylene affect human health and the environment?
- What EPA program offices regulate perchloroethylene, and under what laws is it regulated?
- What other federal agencies or groups can I contact for information on perchloroethylene?

Chemicals can be released to the environment as a result of their manufacture, processing, and use. The EPA has developed information summaries on selected chemicals to describe how you might be exposed to these chemicals, how exposure to them might affect you and the environment, what happens to them in the environment, who regulates them, and whom to contact for additional information. EPA is committed to reducing environmental releases of chemicals through source reduction and other practices that reduce creation of pollutants.

What Is Perchloroethylene, How Is It Used, and How Might I Be Exposed?

Perchloroethylene (also called PERC or tetrachloroethylene) is a colorless, nonflammable liquid. It does not occur naturally but is produced in large amounts (310 million pounds in 1991) by three companies in the United States. US demand for PERC declined about 35% from 1989 to 1991, and is likely to continue to fall. Solvent recycling and reduced demand for chlorofluorocarbons are major reasons for this trend. The largest US user of PERC is the dry cleaning industry. It accounts for 80% to 85% of all dry cleaning fluid used. Textile mills, chlorofluorocarbon producers, vapor degreasing and metal cleaning operations, and makers of rubber coatings also use PERC. It can be added to aerosol formulations, solvent soaps, printing inks, adhesives, sealants, polishes, lubricants, and silicones. Typewriter correction fluid and shoe polish are among the consumer products that can contain PERC. Exposure to perchloroethylene can occur in the workplace or in the environment following releases to air, water, land, or groundwater. Exposure can also occur when people:

- use products containing PERC
- spend time in dry cleaning facilities that use PERC,
- live above or adjacent to these dry cleaning facilities, or
- bring dry cleaned garments into their home.

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PERC enters the body when breathed in with contaminated air or when consumed with contaminated food or water. It is less likely to be absorbed through skin contact. Once in the body PERC can remain, stored in fat tissue.

What Happens to Perchloroethylene in the Environment?

Perchloroethylene evaporates when exposed to air. It dissolves only slightly when mixed with water. Most direct releases of PERC to the environment are to air. It also evaporates from water and soil exposed to air. Once in air, PERC breaks down to other chemicals over several weeks. Because it is a liquid that does not bind well to soil, PERC that makes its way into the ground can move through the ground and enter groundwater. Plants and animals living in environments contaminated with PERC can store small amounts of the chemical.

How Does Perchloroethylene Affect Human Health and the Environment?

Effects of perchloroethylene on human health and the environment depend on how much PERC is present and the length and frequency of exposure. Effects also depend on the health of a person or the condition of the environment when exposure occurs.

Breathing PERC for short periods of time can adversely affect the human nervous system. Effects range from dizziness, fatigue, headaches, and sweating to incoordination and unconsciousness. Contact with PERC liquid or vapor irritates the skin, the eyes, the nose, and the throat. These effects are not likely to occur at levels of PERC that are normally found in the environment.

Breathing perchloroethylene over longer periods of time can cause liver and kidney damage in humans. Workers exposed repeatedly to large amounts of PERC in air can also experience memory loss and confusion. Laboratory studies show that PERC causes kidney and liver damage and cancer in animals exposed repeatedly by inhalation and ingestion. Repeat exposure to large amounts of PERC in air may likewise cause cancer in humans.

Perchloroethylene by itself is not likely to cause environmental harm at levels normally found in the environment. PERC can contribute to the formation of photochemical smog when it reacts with other volatile organic carbon substances in air. These reactions tend to eliminate PERC before it reaches the upper atmosphere in amounts sufficient to damage the ozone layer.

What EPA Program Offices Regulate Perchloroethylene, and Under What Laws Is It Regulated?

EPA OFFICE	LAW	PHONE NUMBER
Pollution Prevention & Toxics	Toxic Substances Control Act (TSCA)	202 554-1404
	Emergency Planning and Community Right-To-Know Act (EPCRA): Regulations (S313)	800 535-0202
	Toxics Release Inventory data	202 260 1531
Air	Clean Air Act	919 541-0888
Solid Waste & Emergency Response	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)	800 535-0202
	Resource Conservation and Recovery Act/EPCRA (304/311/312)	
Water	Clean Water Act	202 260-7588
	Safe Drinking Water Act (Drinking Water Standard: 0.005 mg/L)	800 426-4791

A technical support document is available from the TSCA Assistance Information Service, 202 554-1404.

What Other Federal Agencies or Groups Can I Contact for Information on Perchloroethylene?

AGENCY/GROUP	PHONE NUMBER
Agency for Toxic Substances and Disease Registry	404 639-6000
American Conference of Governmental Industrial Hygienists	513 742-2020
Consumer Product Safety Commission	301 504 0994
Food and Drug Administration	301 443-3170
National Institute for Environmental Health Sciences (EnviroHealth Clearinghouse)	800 6434794
National Institute for Occupational Safety and Health (NIOSH)	800 356 4674
Occupational Safety and Health Administration	(Check your local phone book under U.S. Department of Labor)

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