



Environmental Health Information

Environmental Exposures to Tetrachloroethylene (PERC – CAS # 127-18-4)

Updated February 2011

1. WHAT IS TETRACHLOROETHYLENE (PERC)?

Tetrachloroethylene (also known as PERC, perchloroethylene, and PCE) is a manufactured chemical that is widely used in the dry-cleaning of fabrics, including clothes. Dry cleaners are the single largest users of PERC. Some businesses are using newer alternative solvents, but PERC is still used in most drycleaners. PERC is also used for degreasing metal parts and in manufacturing other chemicals. It is found in consumer products, including some paint and spot removers, water repellents, brake and wood cleaners, glues, and suede protectors.

PERC is a nonflammable, colorless liquid at room temperature. It readily evaporates into air and has an ether-like odor. The odor threshold for PERC is very high, which means that a large amount of PERC must be present in the air before a person can smell it. Odor is not a reliable warning sign of PERC exposure.

2. HOW CAN I BE EXPOSED TO PERC?

A person can be exposed to PERC by breathing it in, drinking PERC-contaminated water, or through direct skin contact.

Public exposure to PERC has historically been related to working in industries that manufacture or use PERC, exposure from living near dry cleaning facilities, or from recently dry-cleaned clothes. In addition, when soil or groundwater is contaminated with PERC, the chemical can change into a gas and move upward through the soil and into homes and buildings.

Recent data suggest that PERC levels in outdoor air have dropped by as much as one-half over the last few decades, mainly due to better control and recovery of PERC used at dry cleaners.

3. HOW DOES MDH DETERMINE SAFE EXPOSURE CONCENTRATIONS FOR PERC?

MDH determines the safe level of exposure to PERC by evaluating health effects observed in people and animals exposed to PERC. In 2006, MDH derived Risk Assessment Advice for PERC. Risk Assessment Advice is a concentration in air where health effects are not expected to occur.

Health effects from chemicals are grouped into non-cancer and cancer effects. Information on non-cancer effects comes from studies of people who have been exposed to high levels of PERC, such as in the workplace. According to many studies, the most sensitive non-cancer health effects appear to be neurological effects, which affect a person's ability to respond to visual stimuli. Some examples include slower reaction time, decreased attention/eye focus, and difficulty distinguishing between certain colors. Other non-cancer effects of PERC exposure include eye, nose, and throat irritation, dizziness, headaches, and nausea. MDH has determined that exposure to an annual average PERC air concentration of $100 \mu\text{g}/\text{m}^3$ will protect people from subtle neurological effects and other non-cancer health effects in people.

Based on animal studies, PERC has been classified as a likely human carcinogen. MDH used a cancer potency screening value for PERC derived by EPA. This value suggests that exposure to an annual average PERC air concentration of 20 µg/m³ for a lifetime will result in no more than 1 additional cancer per 100,000 people. This means that a person has less than 1/100,000 chance of getting cancer from lifetime PERC exposure at these levels. The actual cancer risk may be zero. MDH uses a lifetime cancer risk of no more than 1/100,000 as a criterion for exposures to carcinogens.

In 2008, the U.S. EPA released a new draft Toxicological Review of Tetrachloroethylene for external peer review. The National Research Council (NRC) of the National Academy of Sciences reviewed the draft and provided recommendations. The values MDH has are within the range of health protective values proposed by the NRC.

5. WHAT IS A SAFE EXPOSURE CONCENTRATION FOR PERC?

Based on the review of available exposure data and assessments done by other agencies, MDH is currently recommending 20 µg/m³ as the safe long-term exposure concentration that is protective of both non-cancer and cancer health effects. Even if the PERC exposure occurs at 20 µg/m³ every day for a lifetime, health effects are not expected to occur.

6. WHAT SHOULD I DO IF I AM CONCERNED ABOUT BEING EXPOSED TO PERC?

If you are concerned about a possible exposure to PERC, you can contact the MDH/Site Assessment and Consultation unit to determine a course of action. If you are experiencing physical symptoms, contact your health provider. .

For more information contact:

MDH/Site Assessment and Consultation: 651-201-4897 or 1-800-657-3908, press "4" and leave a message.

To obtain a copy of this document in an accessible format (electronic ASCII text, Braille, large print, or audio, please call 651-201-5000. Consumers with hearing or speech disabilities may reach us by calling Minnesota Relay at 1-800-627-3529 or dialing 7-1-1.

This information sheet was prepared in cooperation with the Agency for Toxic Substances and Disease Registry.

