



Trichloroethene (TCE) in Indoor and Outdoor Air

About Trichloroethene

Trichloroethene (also known as trichloroethylene or TCE) is a human-made chemical. TCE is volatile, meaning it readily evaporates into the air at room temperature, where people can sometimes smell it. It is used as a solvent to remove grease from metal, spots from clothing, and as a paint stripper. It is also an ingredient in paints, varnishes, adhesives, and in making other products like furniture and electric/electronic equipment.

Exposure to TCE

People can be exposed to TCE from air, water, food, or skin contact with material and soils containing it. The most common TCE exposures come from breathing indoor air where it is present. However, most people are exposed to TCE at concentrations that are much lower than those known to cause health effects.

Health Risks

TCE exposure can cause health effects on the central nervous system, liver, kidneys, and immune system, and can affect fetal heart development during pregnancy. The United States Environmental Protection Agency classifies TCE as a chemical that causes cancer in humans. As with all exposures, whether or not a person experiences a health effect depends on how much of a chemical they are exposed to, how often the exposure occurs, and how long the exposures last. Individual characteristics such as age, health, lifestyle, and genetics also play a role. If you are concerned about exposure to TCE, talk with a health care provider.

Sources

TCE can get into indoor air when products containing it are used, like glues, adhesives, paint removers, spot removers, and metal cleaners. TCE can also evaporate into the air from household water that comes from contaminated water wells. TCE can enter homes through soil vapor intrusion, which occurs when chemicals evaporate from contaminated groundwater into the air spaces between soil particles and migrate inside through cracks or other openings in a building's foundation. TCE gets into outdoor air when it is released from industrial facilities and when it evaporates from areas where chemical wastes are stored or disposed.

Levels Typically Found in Air

The background indoor air concentrations in homes and office buildings not near known environmental sources of TCE are almost always 1 microgram per cubic meter of air (1 mcg/m³) or less. Background outdoor air levels also are almost always 1 mcg/m³ or less.

Ways to Limit Indoor Air Exposure

The specific recommended action depends on a case-by-case evaluation of the situation. In many cases, removing household sources and maintaining adequate ventilation will help reduce indoor air levels. A sub-slab depressurization system can reduce the amount of TCE entering indoor air by soil vapor intrusion. TCE can also evaporate into the air from household water that comes from contaminated water wells. In these cases, using an activated carbon filter on the water supply also can help reduce the amount of TCE in indoor air.

Guidelines

The New York State Department of Health recommends that TCE concentrations in the air not exceed 2 mcg/m³. This guideline was set at a level below those known or suspected of causing health effects in people and animals. The guideline also assumes that people are continuously exposed to TCE in air, all day, every day, over a lifetime. This is a health protective assumption because most people are not exposed to TCE continuously throughout their life.

The TCE guideline is used to help guide decisions about efforts to reduce TCE exposure. The higher the concentration that TCE is above the guideline level, the greater the urgency to take action to reduce exposure. However, as with all chemicals, reducing exposure is always recommended when concentrations in the air are above background levels.

There is usually a significant TCE source when indoor air concentrations are much greater than the TCE guideline level. New York State Department of Health recommends taking immediate and effective action to reduce exposures when TCE levels in the air are 20 mcg/m³ and greater. This concentration is based on concerns about TCE exposure during pregnancy, particularly during the first trimester, because TCE exposure is a risk factor for fetal heart defects. The specific recommended action depends on a case-by-case evaluation of the situation.

More Information

- Visit www.health.ny.gov/environmental/chemicals/trichloroethene/ for additional technical information.
- Contact us with any questions or concerns about TCE exposure
phone: 1-518-402-7800, e-mail btsa@health.ny.gov, or mail:
New York State Department of Health Bureau of Toxic Substance
Assessment Corning Tower, Room 1743
Empire State Plaza, Albany, NY 12237