

Tetrachlorethene (PCE) from vapour intrusion and your health



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Community information

What is PCE

Tetrachloroethene, also known as tetrachloroethylene, perchloroethene or PCE is a colourless liquid industrial chemical that is widely used at dry cleaners, metal finishers and in electronics manufacturing, amongst other industries. PCE is also used in some consumer products and to make other chemicals.

In the environment PCE breaks down rapidly in air and surface water but much more slowly in soil and groundwater.

Exposure to PCE from vapour intrusion

Contamination of soil and groundwater by PCE can occur from spills and leaks from storage tanks at commercial and industrial sites. If sufficient concentrations of PCE are present in soil or groundwater, PCE vapours can migrate through the soil, underground service infrastructure and building foundations, contaminating the indoor air that we breathe. This is called vapour intrusion.

There are many factors that influence the rate of vapour intrusion. Concentrations in indoor air may fluctuate depending on the weather, building ventilation, heating and cooling.

PCE and health

If you have PCE in your body, most will be removed in your breath with the remainder removed in your urine. When exposure is stopped, most PCE will be removed within hours. PCE does not build up in your body.

PCE is associated with a range of health effects which depend on a number of factors, including how long you have been exposed, how high the concentrations are in air over time and whether you have any other illnesses.

Much of what is known about the health effects of PCE is based on long-term exposures to high concentrations in workplaces.

Inhaling large amounts of PCE over short periods of time (minutes to hours) may result in dizziness or feeling sleepy. Inhaling moderate amounts may also result in headaches. This might occur if using PCE in unventilated places such as cleaning grease from metal in a workshop.

Concentrations in indoor air from vapour intrusion are typically much lower than in work settings. Inhaling lower concentrations of PCE for short periods of time are unlikely to be a concern but over long periods of time may also result in health effects.

Further information

Contact EPA on 1300 372 842
(1300 EPA VIC) or epa.vic.gov.au

Studies have shown that long-term exposure to PCE may affect the central nervous system, kidney, liver, immune and blood (hematologic) systems and development and reproduction. Occupational and residential studies have shown effects on colour vision, visual memory, cognitive function and reaction time.

The International Agency for Research on Cancer recently classified PCE as probably carcinogenic to humans. There is clear evidence of PCE causing cancer in rodents. There is suggestive evidence of bladder cancer, non-Hodgkin lymphoma and multiple myeloma from epidemiological studies.

However, when the World Health Organization (WHO) derived indoor air criteria for PCE, they considered that PCE is not genotoxic. This means that there is likely a concentration below which exposure to PCE will not cause cancer. On this basis, WHO decided that potential effects to the kidney and nervous system were more sensitive (more likely to occur at lower concentrations) and used data for these effects to derive criteria for PCE.

WHO established an annual indoor air guideline value (criteria) for PCE of 0.25 mg/m³ (or 250 µg/m³) for long term exposure.

What if my indoor air exceeds the air quality guidelines?

The indoor air guideline criteria for PCE has been derived with safety factors included and represents an average level across the year. This means the guideline is set at a level where there is no significant risk to your health if you are exposed for a long period of time.

Because there are many factors that influence when and how vapours come into indoor air, the concentrations often fluctuate. If air concentrations exceed the guideline occasionally, it does not mean there is automatically a risk to your health.

In some situations, air concentrations may more frequently exceed the guideline. In these instances it is necessary to take action to improve air quality. Nonetheless, because there are safety factors included in how guidelines are developed, an ongoing exceedance does not automatically mean that your past exposure will have caused a health effect.

If you have any concerns about you or your family's health you are encouraged to discuss these with your regular GP. Your GP can contact EPA's public health unit for further advice on PCE exposure from vapour intrusion.

Reducing your exposure to PCE from vapour intrusion

If you live in an area contaminated with PCE, a way to improve air quality in your home quickly may be to ventilate your house by opening windows and doors, or in houses with a crawlspace, ensuring adequate subfloor ventilation.

This publication is for general guidance only. You should obtain professional advice if you have any specific concern. EPA Victoria has made every reasonable effort to ensure accuracy at the time of publication.

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EPA acknowledges Aboriginal people as the first peoples and Traditional custodians of the land and water on which we live, work and depend. We pay respect to Aboriginal Elders, past and present and recognise their continuing connection to, and aspirations for Country.



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If you need assistance because of a hearing or speech impairment, please visit relayservice.gov.au