

Trichloroethylene (TCE) and Vapor Intrusion

TCE is used in manufacturing refrigerants and as an industrial degreasing solvent. It can also be found in consumer products, including some cleaners, lubricants, adhesives, sealants, furniture care products, and art/hobby supplies.

TCE:

- is a nonflammable, colorless liquid or gas
- evaporates easily into air
- smells sweet at high concentrations; at lower levels, there is no odor
- can be found in the soil and groundwater from use at industrial sites, dry cleaners

People may breathe TCE from:

- using TCE-containing products
- working at a job that uses TCE
- vapors from contaminated soil or groundwater that move into indoor air

Effective June 2022, Minnesota became the first state to restrict most permitted uses of TCE. The ban applies only to facilities required to have an air quality permit from the state.

Health concerns from breathing TCE

Most exposures to TCE from vapor intrusion are to low amounts that are not likely to result in health effects. The possibility of health effects depends on the amount of TCE in air and how long people breathe it. Once TCE enters the body, some will leave in exhaled air. Much of the TCE breathed in gets absorbed and distributed throughout the body via the blood and is quickly eliminated in urine.



Exposure to TCE in the first eight weeks of pregnancy may increase the risk of heart defects in the baby. In most cases, this risk is thought to be extremely low beginning when women are exposed to TCE $\geq 20 \mu\text{g}/\text{m}^3$. TCE may also affect the immune system; a small risk of immune system effects may exist for people exposed to TCE $\geq 200 \mu\text{g}/\text{m}^3$ continuously over a long period of time. TCE may also harm the central nervous system, kidney, liver, and male reproductive system.

Studies in workers and animals breathing very high levels of TCE suggest that long-term exposures may increase the risk of certain types of cancer (kidney, liver, and non-Hodgkin's lymphoma).

TCE Intrusion Screening Values

Intrusion Screening Values (ISVs) are developed to indicate when action may be needed to protect health from vapor intrusion. ISVs are an amount that is safe for people to breathe. This level is protective for sensitive people, including children, pregnant women, and people who already have health issues. The ISVs are set well below levels expected to result in health effects. When ISVs are exceeded, MDH recommends steps be taken to reduce exposures.

Minnesota Department of Health
Site Assessment and Consultation Unit
Phone: 651-201-4897; email: health.hazard@state.mn.us
To obtain this information in a different format, call: 651-201-4897.

| Value | Description |
|--|--|
| 2.1 $\mu\text{g}/\text{m}^3$ | Residential ISV - a safe level that protects all people from health effects. |
| 70 $\mu\text{g}/\text{m}^3$ | Residential Sub-Slab Value (33X ISV) – a safe level in soil vapor beneath a home |
| 7 $\mu\text{g}/\text{m}^3$ | Workplace ISV - a safe level for people who may have exposures in the workplace over many years. |
| 230 $\mu\text{g}/\text{m}^3$ | Commercial/Industrial Sub-Slab Value (33X ISV) – a safe level in soil vapor beneath a workplace |

(measured in micrograms per cubic meter, or $\mu\text{g}/\text{m}^3$)