



## TRICHLOROETHYLENE (TCE) FACT SHEET

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### WHAT IS TRICHLOROETHYLENE?

Trichloroethylene (TCE) is a manufactured chemical. TCE does not occur naturally in the environment. It's a pale blue nonflammable liquid that evaporates easily and has a sweet smell. TCE is commonly used as a metal degreaser. In homes, TCE may be found in typewriter correction fluid, paint, spot removers, carpet-cleaning fluids, metal cleaners, and varnishes. TCE does not easily break down or degrade in soils and groundwater. Therefore, TCE contamination can stay in the environment for a long time.

Most TCE in air comes from metal degreasing activities associated with tool and automobile production. TCE can also enter ground water and surface water from industrial discharges or from improper disposal. TCE has been found in many drinking water supplies in the United States, including Wisconsin.

### HOW ARE PEOPLE EXPOSED TO TRICHLOROETHYLENE?

**Breathing:** Workers in degreasing operations have the highest risk of exposure to TCE. People who live near factories that use TCE may also be exposed to low TCE levels in the air. In homes, people who use TCE as a solvent (such as typewriter correction fluid or paint remover) have exposure; however, the extent of the actual exposure depends on the length of time and the amount of the product used. Showering in water highly contaminated with TCE can also be a source of exposure.

**Touching:** TCE can be absorbed through the skin. Therefore, people who use the compound without solvent-resistant gloves may be exposed.

**Drinking/Eating:** TCE released onto soil can enter groundwater. Therefore, people who drink water from wells located near TCE disposal sites may be exposed. The amount of TCE in commercial products is much more concentrated than in contaminated drinking water. Plants grown on contaminated soil do not accumulate TCE. TCE has been detected at very low levels in many processed foods as a result of its use in equipment-cleaning.

### DO STANDARDS EXIST FOR REGULATING TRICHLOROETHYLENE?

**Water:** The state and federal drinking water standards for TCE are both set at 5 parts per billion (ppb). Municipal wells, which are regulated, are regularly tested for the presence of TCE. Water from unregulated private residential wells is sometimes contaminated with TCE from industry or old landfills. When groundwater in an area is found to have TCE, private well owners may be advised to stop drinking water containing more than the standard. In rare cases where levels of TCE are found to be very high in water you may be advised to avoid washing, bathing, or using the water for purposes other than toilet flushing.

**Air:** The Wisconsin Department of Natural Resources (DNR) regulates the amount of TCE that can be released into outdoor ambient air by industries.

The DNR has set a residential indoor air action level for TCE at 0.39 parts per billion by volume (ppbV). The action level is considered to be protective of public health. If TCE concentrations in air are above the action level, we recommend taking an action to halt exposure even if the levels are not high enough to cause immediate harm.

If TCE-containing products are being used around you, you may be able to smell the chemical. If you can smell the chemical, the level is too high to be safe for exposure over long periods of time. Therefore, TCE-containing products should either be used briefly in small amounts, or should be used in well-ventilated areas.

## WILL EXPOSURE TO TRICHLOROETHYLENE RESULT IN HARMFUL HEALTH EFFECTS?

In general, a chemical will affect the same organ systems in all people who are exposed. However, the seriousness of the effects may vary from person to person. A person's reaction depends on several things, including individual health, heredity, previous exposure to chemicals including medicines, and personal habits such as smoking or drinking.

It's also important to consider the length of exposure to the chemical, the amount of chemical exposure, and whether the chemical was inhaled, touched, or eaten.

The following health effects may occur immediately or shortly after inhaling air that contains very high levels of TCE (more than 50,000 ppbV):

- Heart problems including cardiac arrhythmias;
- Nausea and vomiting;
- Serious liver injury;
- Dizziness, headache, neurological problems; and
- Eye, nose and throat irritation.

Exposures of this degree would usually only be found in occupational settings.

**Developmental Effects:** Animal studies indicate there may be an association between maternal exposure to TCE and specific heart defects in the offspring. There is some evidence that human exposure to TCE while pregnant may be associated with similar effects. Pregnant women should avoid exposure to TCE.

The following health effects can occur after several years of exposure to TCE:

**Cancer:** There is growing evidence in studies of animals and people who handle pure TCE (very high levels) of increased rates of cancers of the kidney, liver, and non-Hodgkins lymphoma. The U.S. Environmental Protection Agency (EPA) currently characterizes TCE as "carcinogenic to humans" by all routes of exposure.

**Other Effects:** In lab animals, inhaling TCE vapors or drinking TCE-contaminated water can cause effects in kidney, liver, lung and the immune system. In order to protect the most sensitive people in the general public from TCE-related health effects, the Wisconsin Department of Health Services (DHS) and DNR screening values are set far below the concentrations known to cause effects.

## CAN A MEDICAL TEST DETERMINE EXPOSURE TO TRICHLOROETHYLENE?

There are tests to detect TCE in the breath, urine, and blood of people exposed to high levels of the compound within the previous 24 hours. TCE cannot be measured in people when it results from long-term, low-level exposure. Those suspecting TCE exposure over a long period of time should contact their physician. Blood chemistry analyses which include liver and kidney function tests may be helpful.

Seek medical advice if you have any symptoms that you think may be related to chemical exposure.

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This fact sheet summarizes information about this chemical and is not a complete listing of all possible effects. It does not refer to work exposure or emergency situations.

For more information, contact:

- Wisconsin Poison Center, 800-222-1222
- Your Local Health Department: <http://www.dhs.wisconsin.gov/localhealth/>
- Division of Public Health, Bureau of Environmental and Occupational Health, (608) 266-1120:  
<http://www.dhs.wisconsin.gov/eh/>