

The ToxGuide™ is developed to be used as a pocket guide. Tear off at perforation and fold along lines.

## Sources of Exposure

### General Populations

- Exposure occurs principally by inhalation of low levels in air or ingestion of very low levels in water. These levels may be higher for people living near hazardous waste sites.
- Very small amounts of 1,1,1-trichloroethane have been found in some food items.
- People who still have at home consumer products such as glues, cleaners, and aerosol sprays that have 1,1,1-trichloroethane may be exposed to it by breathing vapors or by skin contact with the liquid.
- Intentional exposure can occur via sniffing household chemicals in an attempt to get “high”.

### Occupational Populations

- Exposure can occur during the manufacture of 1,1,1-trichloroethane for export or as a chemical intermediate in the manufacture of hydrofluorocarbons.

## Toxicokinetics and Normal Human Levels

### Toxicokinetics

- 1,1,1-Trichloroethane is rapidly and efficiently absorbed by the inhalation route.
- Pulmonary absorption of 1,1,1-trichloroethane is saturable.
- Animal data indicate a rapid and complete absorption through the gastrointestinal tract.
- Liquid 1,1,1-trichloroethane is absorbed to a lesser extent through the skin.
- Data in animals suggest that 1,1,1-trichloroethane would probably distribute preferentially to fatty tissues.
- 1,1,1-Trichloroethane is poorly metabolized.
- <10% of the absorbed dose is metabolized by P-450 enzymes to trichloroethanol and trichloroacetic acid, which are excreted in the urine.
- Most of the absorbed 1,1,1-trichloroethane is rapidly excreted as parent compound in expired air.
- 1,1,1-Trichloroethane does not accumulate in the body.

### Normal Human Levels

- Mean of 0.34 ppb (µg/L) in blood of non-occupationally exposed subjects in a national survey in 1994.

## Biomarkers/Environmental Levels

### Biomarkers

- 1,1,1-Trichloroethane in blood, breath, and urine is a biomarker of exposure to this chemical.
- Trichloroethanol and trichloroacetic acid in urine are non-specific biomarkers of exposure to 1,1,1-trichloroethane, unless exposure to other chemicals can be ruled out.
- Assay for the parent compound must be done soon after exposure; assays of the metabolites are more useful for a longer period after exposure.

### Environmental Levels

#### *Air*

- Typically 0.1–1.0 ppb in city air in the U.S.; <0.1 ppb in rural air.

#### *Sediment and Soil*

- No representative values available due probably to rapid volatilization.

#### *Water*

- Usually <1 ppb in surface waters; 0.01–3.5 ppb in drinking water from surface or groundwater sources.

### Reference

Agency for Toxic Substances and Disease Registry (ATSDR). 2006. Toxicological Profile for 1,1,1-Trichloroethane (Update). Atlanta, GA: U.S. Department of Health and Human Services, Public Health Services.

# ToxGuide™

for

## 1,1,1-Trichloroethane



CAS# 71-55-6

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U.S. Department of Health and Human Services  
Public Health Service  
Agency for Toxic Substances and Disease Registry  
[www.atsdr.cdc.gov](http://www.atsdr.cdc.gov)

**Contact Information:**  
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## Chemical and Physical Information

### 1,1,1-Trichloroethane is a liquid

- 1,1,1-Trichloroethane is a manufactured organic solvent.
- 1,1,1-Trichloroethane is a colorless liquid that burns easily when it contacts a spark or flame.
- 1,1,1-Trichloroethane is volatile and has a sweet, sharp odor.
- It dissolves slightly in water and is miscible with most common organic solvents.
- In the past, it was used in industry as a solvent and as a cleaner for metal parts.
- At home, it was an ingredient of cleaners, glues, and aerosol sprays.
- Currently, limited amounts of 1,1,1-trichloroethane are produced for export.

## Routes of Exposure

- Inhalation** – Primary route of exposure for the general population, people near waste sites, and workers involved in the manufacture or use of 1,1,1-trichloroethane.
- Oral** – Route of exposure at or near waste sites via ingestion of contaminated media. Certain foods also contain small amounts of 1,1,1-trichloroethane.
- Dermal** – Route of exposure for workers involved in the manufacture and use of 1,1,1-trichloroethane and for people near waste sites via skin contact with contaminated media.

### 1,1,1-Trichloroethane in the Environment

- Most 1,1,1-trichloroethane released into the environment moves to the air, where it can last for about 6 years.
- 1,1,1-Trichloroethane in air can travel to the ozone layer where it undergoes photolysis.
- Much of 1,1,1-trichloroethane released to surface water or soil evaporates rapidly to the air; the remaining portions can be broken down by microorganisms.
- 1,1,1-Trichloroethane is expected to be mobile in soil and readily leach into groundwater.
- 1,1,1-Trichloroethane does not accumulate in animals or in plants.

## Relevance to Public Health (Health Effects)

Health effects are determined by the dose (how much), the duration (how long), and the route of exposure.

### Minimal Risk Levels (MRLs)

#### Inhalation

- An MRL of 2 ppm has been derived for acute-duration inhalation exposure ( $\leq 14$  days).
- An MRL of 0.7 ppm has been derived for intermediate-duration inhalation exposure (15–364 days).
- No chronic-duration inhalation MRL was derived for 1,1,1-trichloroethane.

#### Oral

- An MRL of 20 mg/kg/day has been derived for intermediate-duration oral exposure (15–364 days).
- No acute- or chronic-duration oral MRLs were derived for 1,1,1-trichloroethane.

### Health Effects

- High levels of 1,1,1-trichloroethane in the air can cause dizziness, lightheadedness, and loss of coordination.
- Very high concentrations of 1,1,1-trichloroethane can lower blood pressure and damage the myocardium.

- Skin contact with the liquid can produce effects ranging from mild irritation to chemical burns, as exposure duration increases.
- High levels of 1,1,1-trichloroethane in the air can cause eye irritation.
- Based on no data in humans and inadequate data in animals, the EPA has determined that 1,1,1-trichloroethane is not classifiable as to human carcinogenicity.
- NTP has not classified 1,1,1-trichloroethane for human carcinogenicity.

### Children's Health

- Children exposed to 1,1,1-trichloroethane probably would experience the same effects as adults.
- It is not known whether children are more susceptible to 1,1,1-trichloroethane poisoning than adults.