

## **WHAT YOU NEED TO KNOW ABOUT TOLUENE**

### **What is Toluene?**

Toluene is a clear, colorless liquid with a distinctive, sweet odor. It is also a volatile organic compound, meaning it can turn into a gas. Toluene is included in the petroleum contamination group, along with benzene and xylene.

Toluene can occur naturally in crude oil or in the tolu tree. It is also produced in the process of making gasoline and other fuels from crude oil and in making coke from coal.

### **What is Toluene Used For?**

Toluene is primarily used as a mixture added to gasoline to improve octane ratings. However, toluene is also used in the production of various chemicals, including:

- Benzene
- Trinitrotoluene (TNT)
- Benzoic Acid
- Benzoyl Chloride
- Toluene Diisocyanate

In addition to the production of certain chemicals and being a gasoline additive, toluene is also used to produce a number of consumer products, including:

- Paints
- Paint Thinner
- Antifreeze
- Lacquers
- Coatings
- Synthetic Fragrances
- Adhesives
- Inks
- Cleaning Agents
- Polyurethane
- Plastic Soda Bottles
- Pharmaceuticals
- Dyes
- Nylon
- Heating Oil
- Kerosene

- Cosmetic Nail Products
- Shoe polish

### **How Might I Be Exposed to Toluene?**

Toluene exposure can occur as a result of using common household products, including, paints, synthetic fragrances, nail polish and some cleaning agents. You may also be exposed to toluene via cigarette smoke, whether you are directly smoking or exposed to second-hand smoke. Teens may also be exposed to toluene through solvent abuse--by deliberately sniffing glue or paint. However, a majority of toluene exposure occurs occupationally, to workers at plants that use or manufacture toluene or in occupations with regular exposure to toluene containing products such as painters, printers or heavy traffic occupations.

You may also be exposed to toluene in a different way. Toluene gets into the air, water and soil at places where it is produced or heavily used. For that reason, individuals living near industries where toluene is manufactured or used, or gas stations with underground petroleum storage tanks, are at a heightened risk of toluene exposure. If the factory has an accidental toluene spill or the gas station has a leaking underground tank, toluene can get into the groundwater and contaminate the water source of nearby neighbors who use private wells. Additionally, if the groundwater in a neighborhood is contaminated with toluene, residents need to check for vapor contamination in their homes, because toluene can turn into a gas and migrate up through the soil and into the air inside buildings through tiny foundation cracks. Additionally, as toluene is present in vehicle emissions, living near a highway can increase toluene exposure.

### **What Happens to Toluene in the Environment?**

While toluene can enter the environment any time you use a product containing it, toluene generally enters surface and ground water from spills of toluene, or products containing it at factories, or from leaking underground storage tanks. Toluene may also enter soil or groundwater when it, or products containing it, are disposed of in landfills or hazardous waste disposal sites.

### **What Are The Health Effects of Toluene?**

The International Agency for Research on Cancer (IARC), a division of the World Health Organization (WHO), has concluded that there is inadequate human evidence to determine the carcinogenicity of toluene. As such, IARC has determined that toluene is

“not classifiable as to its carcinogenicity in humans.” Similarly, the United States Environmental Protection Agency (US EPA) has determined that there is inadequate information to assess the possible carcinogenic effects of toluene. This does not mean that toluene does not cause cancer, only that it has not been proven in studies to date.

However, exposure to toluene may negatively affect kidney, liver, brain, heart, and nervous system functions. The organ primarily targeted by toluene toxicity for both short-term and long-term exposures is the central nervous system. Other areas commonly affected by toluene exposure include the immune system, kidneys and liver. These harmful effects can include:

- Cognitive Impairment
- Color vision Loss
- Hearing Loss
- Impaired Speech
- Cerebral Atrophy
- Cardiac Arrhythmia
- Congestion and Hemorrhage of the Lungs
- Tubular Kidney Necrosis
- Swollen Liver
- Necrosis of Myocardial Fibers
- Brain damage
- Death

Symptoms of toluene exposure include:

- Fatigue
- Sleepiness
- Headache
- Nausea
- Ataxia
- Dizziness
- Depression
- Tremors
- Confusion
- Weakness
- Swollen Liver
- Loss of Appetite
- Nystagmus
- Sleep Disturbances
- Difficulty Breathing
- Memory Loss

- Unconsciousness
- Poor balance
- Loss of muscle control

Toluene exposure has also been linked to various developmental defects in children of women who were exposed to toluene while pregnant. These developmental defects include: central nervous system dysfunction; attention deficits; developmental delays; dysmorphism; temporary renal tubular acidosis; and craniofacial and limb abnormalities.

### **Is there a Medical Test That Shows Whether I Have Been Exposed to Toluene?**

Toluene and its breakdown products can be measured in both blood and urine. However, because toluene and its breakdown products leave the body rapidly, these tests must be completed within 12 hours of exposure.

While tests do exist to detect toluene exposure, these tests are unable to predict what, if any, health effects may occur as a result of the exposure.

### **How Can I Reduce my Family's Risk of Exposure to Toluene?**

1. Use consumer products containing toluene (such as paints and adhesives) in well ventilated areas. When not in use, these products should be tightly covered and out of the reach of children. Storing these products outside in a shed may further reduce the risk of exposure.
2. Talk to your teenager about the dangers of solvent abuse.
3. Get your private well water and the air inside your home tested.
4. Avoid drinking water from contaminated sources. Drink bottled water until a solution can be reached. Limit showers and baths or use bottled water.
5. Demand the polluter connect your family to a clean water source.
6. Prevent children from playing in the dirt if you live near a toluene-contaminated site.
7. Seal sump pumps and foundation cracks and increase the ventilation in your home.
8. If necessary, demand the polluter install a vapor mitigation system to get rid of toxic vapors.
9. Demand the polluter clean up the contaminated site.
10. Contact an experienced environmental lawyer to help you with each of these steps.

### **What Should I Do if I'm Concerned My Health May be Affected?**

See your family doctor or an occupational doctor familiar with chemical exposure. Let them know you have been exposed to toluene and bring any toluene test results with you.

Toluene Can Also Be Known As The Following: Benzene, methyl; Methacide; Methylbenzene; Methylbenzol; Phenylmethane; Antisal 1a; Toluol; Methane, phenyl-; NCI-C07272; Toluene; Toluen; Toluolo; Rcra waste number U220; Tolu-sol; UN 1294; Dracyl; Monomethyl benzene; CP 25; NSC 406333; methylbenzene.

### **Links**

<https://www.atsdr.cdc.gov/substances/toxsubstance.asp?toxid=29>

<https://www.atsdr.cdc.gov/toxfaqs/TF.asp?id=160&tid=29>

<https://www.atsdr.cdc.gov/toxguides/toxguide-56.pdf>

<https://www.epa.gov/sites/production/files/2016-09/documents/toluene.pdf>

[https://toxtown.nlm.nih.gov/text\\_version/chemicals.php?id=30](https://toxtown.nlm.nih.gov/text_version/chemicals.php?id=30)