

## METHYL TERT-BUTYL ETHER

### What is methyl tert-butyl ether?

Methyl tert-butyl ether (MTBE) is a colorless liquid that catches fire easily and burns fast. It has a strong, bad smell, similar to turpentine. MTBE is made by blending chemicals such as isobutylene and methanol. Since the 1980s, unleaded gasoline has contained MTBE to reduce smog and pollution.

### Where can methyl tert-butyl ether be found and how is it used?

Nearly all the MTBE made in the United States is blended with gasoline so it burns cleaner.

### How can people be exposed to methyl tert-butyl ether?

You could be exposed to MTBE through:

- **Breathing MTBE** in indoor or outdoor air, such as when pumping gasoline and inhaling exhaust fumes. It could also occur while driving a vehicle or when breathing polluted air near highways or in cities.
- **Drinking** water contaminated with MTBE. This might occur near leaking gasoline storage tanks.
- **Touching** gasoline while pumping gas.
- **Eye contact** by accidentally splashing gasoline in the eyes, or by touching the eyes after touching gasoline.

### How does methyl tert-butyl ether work and how can it affect my health?

MTBE enters your body if you breathe air or drink water containing it, or if you touch it. Most of the MTBE that you breathe in or ingest can get into your blood. Not as much gets into the blood through the skin. Most MTBE that enters the body is exhaled. Any remaining MTBE leaves the body within one or two days in exhaled air or in urine.

Some people exposed to high levels of MTBE complain of headaches and upset stomach. Others experience dizziness, lightheadedness, confusion, and soreness in the nose or throat. Most people smell MTBE's strong odor before harmful effects occur.

Sometimes MTBE is given to patients with gall bladder stones. It is applied through a tube that goes into the gall bladder. If MTBE leaks into other parts of the body, the patient could have minor liver damage, lowered white blood cells, or other short-term effects such as upset stomach, sleepiness, dizziness, or confusion.

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Animal studies of airborne MTBE showed nervous system problems as the most common effect. For about an hour, the animals acted drunk. They became less active, fell down, and had partly closed eyes. Then the animals seemed normal again. Some rats and mice died, and some had nose and throat irritation. Long-term problems were less weight gain, kidney disease, cancer, and enlarged livers. There were birth defects in some young. MTBE also irritated their eyes. Rats and mice that received MTBE orally had nervous system problems, diarrhea, and stomach irritation. Some animals had very slight liver damage. When MTBE was placed on the animals' skin, it became irritated. The levels of MTBE used in these studies were much higher than the levels at which people would be exposed.

There is no evidence that MTBE causes cancer in humans.

### **How is methyl tert-butyl ether poisoning treated?**

There is no treatment for MTBE poisoning, but the symptoms can be treated. Medical providers can treat heart and breathing problems.

### **What should I do if exposed to methyl tert-butyl ether?**

- **If MTBE gets on your skin or hair**, wash with plain water for two to three minutes. Then, wash with mild soap. Rinse thoroughly with water.
- **If MTBE gets in your eyes**, remove contact lenses if you can do it easily. Rinse exposed or irritated eyes with plain water or saline for 15 minutes. Get medical help if the symptoms do not go away.
- **If you eat or drink gasoline or other liquid containing MTBE**, do not throw up. Do not take activated charcoal. Get medical help.

### **What factors limit use or exposure to methyl tert-butyl ether?**

Safe work procedures reduce exposure in the workplace. Provide fresh air and wear protective clothing. Since MTBE is highly flammable, check containers often for leaks, spills, or open containers. Promote fire safety by storing MTBE far away from open flames and electrical sparks. Outside of work, avoid exposure by not breathing vapors when filling your gas tank.

### **Is there a medical test to show whether I've been exposed to methyl tert-butyl ether?**

The breath, blood, or urine can be tested for up to two days after MTBE exposure to determine if the person was exposed.

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## Technical information for methyl tert-butyl ether

CAS Number: 1634-0404

Chemical Formula: C<sub>5</sub>H<sub>12</sub>O

Carcinogenicity (EPA): has not classified methyl tert-butyl ether with respect to potential carcinogenicity.

MCL (Drinking Water): US EPA has no MCL for MTBE. Delaware has an action level of 10 ppb. U.S. EPA has issued guidelines recommending that, to protect children, drinking water levels of MTBE not exceed 4 milligrams per liter of water (4 mg/L) for an exposure of one to 10 days, and 3 mg/L for longer-term exposures.

OSHA Standards: There is no standard for MTBE.

NIOSH Standards: There is no standard for MTBE.

ACGIH: 8 hr. Time Weighted Average (TWA): 50 ppm in air

## References and Sources

Agency for Toxic Substances and Disease Registry (ATSDR). 1996. *Toxicological profile for methyl t-butyl ether*. Atlanta, GA: U.S. Department of Health and Human Services. <https://wwwn.cdc.gov/TSP/ToxProfiles/ToxProfiles.aspx?id=228&tid=41>