



**Bureau of  
Environmental Health  
Health Assessment Section**

"To protect and improve the health of all Ohioans"

# 1,3-Butadiene

(bew 'tah die' een)

## Answers to Frequently Asked Health Questions

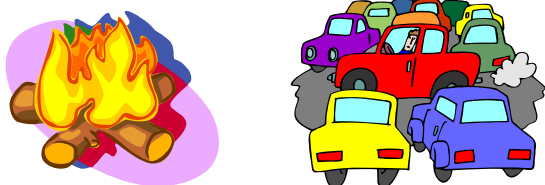
### What is 1,3-butadiene?

1,3-butadiene is a colorless gas that has a mild gasoline-like odor. 1,3-butadiene gas is produced and released when petroleum products (oil, gasoline and coal) are burned. The 1,3-butadiene gasses can then be captured in the exhaust smoke, refined, and used to make several of the products we use every day.

### How is 1,3-butadiene used?

Large amounts of 1,3-butadiene are produced every year. About 75% of the manufactured 1,3-butadiene is used to make synthetic rubber found in car and truck tires. 1,3-butadiene is also used to make plastics and acrylics.

Small amounts of 1,3-butadiene can be found in gasoline and in car and truck exhaust. Small amounts of 1,3-butadiene can also found the smoke from wood fires and in cigarette smoke.



### What happens to 1,3-butadiene in the environment?

1,3-butadiene evaporates quickly into the air and chemically breaks down in a short time. Sunlight greatly increases this chemical breakdown process.

We do not have reliable methods to test 1,3-butadiene in soil or water so we do not exactly know what happens to it when it comes in contact with them. However, based on 1,3-butadiene chemical properties, if it were spilled in water or on soil, we expect it to evaporate quickly into the air.

We do not expect 1,3-butadiene to collect in plants, fish tissue or in the sediment of rivers and lakes. We also don't expect 1,3-butadiene to be found in underground water sources, but we don't know this for sure.

Therefore, we also do not know how long it takes for 1,3-butadiene to break down in soil or in water because these types of studies have not been done.

### How are you exposed to 1,3-butadiene?

Because 1,3-butadiene is a gas, we are most likely exposed to it by breathing. Due to increased truck and car exhaust, 1,3-butadiene can be found at low levels in the air samples taken in urban areas (cities) and the suburban communities. But these levels are generally not high enough to be a serious health threat. **Important note:** A known human health threat, cigarette smoke, also produces 1,3-butadiene gas smokers inhale directly into their lungs.

### Can you get sick from 1,3-butadiene?

Yes, we can get sick. But getting sick will depend on the contact (exposure) you had with the chemical.

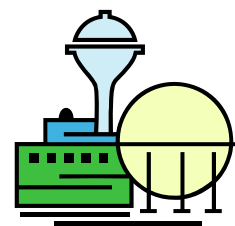
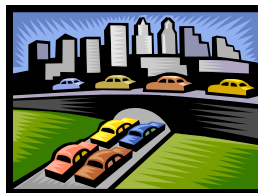
#### Exposure:

- How much you were exposed to (dose).
- How long you were exposed (duration).
- How often you were exposed (frequency).
- General Health, Age, Lifestyle  
Young children, the elderly and people with chronic (on-going) health problems are more risk to chemical exposures.

### Who is more likely to come in contact with higher levels of 1,3-butadiene?

Higher level of 1,3-butadiene in the air come from leaks or intentional releases at industrial and manufacturing plants that make or use 1,3-butadiene. Higher levels can be found in:

- People breathing polluted workplace air where 1,3-butadiene is manufactured or used to make rubber, plastics, and resins.
- People breathing polluted air from waste incineration or wood fires.
- People breathing polluted air near chemical, plastic, and rubber facilities that use 1,3-butadiene.
- People drinking contaminated water near 1,3-butadiene production or waste sites.



## What are some of the health problems caused by 1,3-butadiene?

The health problems caused by 1,3-butadiene will depend on the amount of chemical found in the environment and the length of time a person has contact with the substance.

There are currently no studies that show health problems are seen in people who breathe low levels of 1,3-butadiene over many years. But breathing increased levels of 1,3-butadiene over a short period of time can cause irritation of the eyes, nose and throat. And occupational (work) health studies of rubber industry workers found health problems such as heart diseases, blood diseases, lung diseases and cancer from the long-term exposure to increased levels of 1,3-butadiene. However, it is important to note that these rubber industry workers were also exposed to high levels of other hazardous chemicals as well as the 1,3-butadiene, so it is difficult to pinpoint which chemical (or likely the combination of them) caused these health problems.

Breathing high levels of 1,3-butadiene for a short time can cause central nervous system damage, blurred vision, nausea (upset stomach), fatigue (tired), headache, decreased blood pressure, decrease pulse rate and unconsciousness.

If spilled on skin or clothing, 1,3-butadiene can cause burns or frostbite (due to rapid vaporization).

Currently there is no information of health problems from eating food or drinking water containing 1,3-butadiene.

## Does 1,3-butadiene cause cancer?

The U.S. Department of Health and Human Services 11th Report on Carcinogens states 1,3-Butadiene is *known to be a human carcinogen* (causes cancer).

### ***Known To Be Human Carcinogen:***

There is sufficient evidence of carcinogenicity from studies in humans, which indicates a causal relationship between exposure to the agent, substance, or mixture, and human cancer.

## Is there a test to show whether you have been exposed to 1,3-butadiene?

There is currently no good medical test to find out whether you have been exposed to 1,3-butadiene. But scientists are currently working on a trustworthy method of testing blood.

## What has been done to protect human health?

The American Congress of Governmental Industrial Hygienists (ACGIH) has set an occupational exposure limit of 2 parts of 1,3-butadiene parts per million (ppm) to air.

The Environmental Protection Agency (EPA) requires that discharges or spills into the environment of one (1) pound or more of 1,3-butadiene be reported.

## References

The Agency for Toxic Substances and Disease Registry (ATSDR). 1993. Toxicological profile for 1,3-butadiene.

Report on Carcinogens, Eleventh Edition; U.S. Department of Health and Human Services, Public Health Service, National Toxicology Program, 2006.

The National Institutes of Health, U.S. Department of Health and Human Services, National Library of Medicine, Hazardous Substance Databank. 1,3-butadiene, CASRN: 106-99-0.

## Where can I get more information?

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