

This fact sheet answers the most frequently asked health questions (FAQs) about ethylene glycol. For more information, call the CDC Information Center at 1-800-232-4636. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** Ethylene glycol is a clear liquid used in antifreeze and de-icing solutions. Exposure to large amounts of ethylene glycol can damage the kidneys, nervous system, lungs, and heart. Ethylene glycol has been found in at least 37 of 1689 National Priorities List (NPL) sites identified by the Environmental Protection Agency (EPA).

## What is ethylene glycol?

Ethylene glycol is a synthetic liquid substance that absorbs water. It is odorless, but has a sweet taste.

Ethylene glycol is used to make antifreeze and de-icing solutions for cars, airplanes, and boats. It is also used in hydraulic brake fluids and inks used in stamp pads, ballpoint pens, and print shops.

## What happens to ethylene glycol when it enters the environment?

- The primary source of ethylene glycol in the environment is from run-off at airports where is used in de-icing agents for runways and airplanes. Ethylene glycol can also enter the environment through the disposal of products that contain it.
- Ethylene glycol in air will break down in about 10 days.
- Ethylene glycol in water and in soil will breakdown within several days to a few weeks.

## How might I be exposed to ethylene glycol?

- The general public can be exposed to ethylene glycol through skin contact when using antifreeze.
- Accidental or intentional ingestion can occur because antifreeze is a sweet tasting, brightly colored liquid.
- Exposure to ethylene glycol in air, drinking water, or soil is not expected.

- People who work in industries that use ethylene glycol may be exposed by touching products such as solvents, antifreeze, and feedstocks that contain this substance.
- Workers can also be exposed to low levels from ethylene glycol-containing products such as airplane de-icing solutions that have been sprayed into the air.

## How can ethylene glycol affect my health?

Your health is not likely to be seriously affected by the very small amounts of ethylene glycol that could be tasted or otherwise accidentally eaten (for example, by putting your fingers in your mouth after getting them wet with antifreeze). Accidental or intentional ingestion of larger amounts of ethylene glycol can cause serious illness or death.

When ethylene glycol breaks down in the body it forms chemicals that crystallize, and the crystals can collect in your kidneys and can affect kidney function.

Ethylene glycol also forms acidic chemicals in the body, which can change the body's acid/base balance and affect your nervous system, lungs, and heart.

Early diagnosis and treatment have been very successful in people drinking large amounts of ethylene glycol.

# Ethylene Glycol

CAS # 107-21-1

## How likely is ethylene glycol to cause cancer?

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified ethylene glycol for carcinogenicity.

Studies with people who used ethylene glycol did not show carcinogenic effects. Animal studies also have not shown ethylene glycol to be carcinogenic.

## How can ethylene glycol affect children?

Clinical findings in children who were poisoned by accidentally or intentionally drinking ethylene glycol indicate that it is likely that children would show the same health effects as adults. We do not know whether children differ in their susceptibility to the effects of ethylene glycol.

We do not know whether ethylene glycol causes birth defects in people. Skeletal defects and low birth weights have occurred in newborn animals whose mothers ingested large amounts of ethylene glycol during pregnancy.

## How can families reduce the risk of exposure to ethylene glycol?

- Antifreeze products should be used with caution and kept out of the reach of children. Open bottles of antifreeze should not be left on or near the ground where children can reach them.
- Ethylene glycol poisoning can be effectively treated, but early diagnosis is needed to prevent serious injury. Medical attention should be sought as soon as possible in cases of known or suspected antifreeze ingestion.

- Minimize skin contact when using antifreeze and other consumer products containing ethylene glycol. Avoid spilling or draining antifreeze on the ground to prevent children from playing in a puddle of ethylene glycol.

## Is there a medical test to determine whether I've been exposed to ethylene glycol?

Ethylene glycol and its metabolites can be measured in blood and urine. The metabolites cause characteristic chemical changes in the blood and urine that help to diagnose ethylene glycol poisoning.

You should have these tests done within a few hours after exposure occurs because ethylene glycol leaves the body very quickly and early diagnosis is necessary for effective treatment.

The presence of crystals in the urine may indicate kidney damage.

## Has the federal government made recommendations to protect human health?

The EPA has determined that exposure to ethylene glycol in drinking water at concentrations of 20 mg/L for 1 day or 6 mg/L for 10 days is not expected to cause any adverse effects in a child.

The EPA has determined that lifetime exposure to 14 mg/L ethylene glycol is not expected to cause any adverse effects.

## References

Agency for Toxic Substances and Disease Registry (ATSDR). 2010. Toxicological Profile for Ethylene Glycol. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service.

## Where can I get more information?

For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology and Human Health Sciences, 1600 Clifton Road NE, Mailstop F-57, Atlanta, GA 30329-4027.

Phone: 1-800-232-4636

ToxFAQs™ Internet address via WWW is <http://www.atsdr.cdc.gov/toxfaqs/index.asp>.

ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.