

This fact sheet answers the most frequently asked health questions (FAQs) about formaldehyde. 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 that you understand this information because this substance may cause harm to you if you are exposed to it. 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:** Everyone is exposed to small amounts of formaldehyde in air and some foods and products. Formaldehyde can cause irritation of the eyes, nose, and throat and neurological effects. Formaldehyde has been found in at least 29 of the 1,669 National Priorities List sites identified by the Environmental Protection Agency (EPA).

## What is formaldehyde?

At room temperature, formaldehyde is a colorless, flammable gas that has a distinct, pungent smell. Small amounts of formaldehyde are naturally produced by plants, animals, and humans.

It is used in the production of fertilizer, paper, plywood, and urea-formaldehyde resins. It is also used as a preservative in some foods and in many house-hold products, such as antiseptics, medicines, and cosmetics.

## What happens to formaldehyde when it enters the environment?

- Once formaldehyde is in the air, it is quickly broken down, usually within hours.
- Formaldehyde dissolves easily but does not last a long time in water.
- Formaldehyde evaporates from shallow soils.
- Formaldehyde does not build up in plants and animals.

## How might I be exposed to formaldehyde?

- The primary way you can be exposed to formaldehyde is by breathing air containing it.
- Releases of formaldehyde into the air occur from industries using or manufacturing formaldehyde, wood products (such as particle-board, plywood, and furniture), automobile exhaust, cigarette smoke, paints and varnishes, and carpets and permanent press fabrics.
- Indoor air contains higher levels of formaldehyde than outdoor air. Levels of formaldehyde measured

in indoor air range from 0.02–4 parts per million (ppm). Formaldehyde levels in outdoor air range from 0.0002 to 0.006 ppm in rural and suburban areas and 0.001 to 0.02 ppm in urban areas.

- Breathing contaminated workplace air. The highest potential exposure occurs in the formaldehyde-based resins industry.

## How can formaldehyde affect my health?

Nasal and eye irritation, neurological effects, and increased risk of asthma and/or allergy have been observed in humans breathing 0.1 to 0.5 ppm. Eczema and changes in lung function have been observed at 0.6 to 1.9 ppm.

Decreased body weight, gastrointestinal ulcers, liver and kidney damage were observed in animals orally exposed to 50–100 milligrams/kilogram/day (mg/kg/day) formaldehyde.

## How likely is formaldehyde to cause cancer?

The Department of Health and Human Services (HHS) determined in 2011 that formaldehyde is a known human carcinogen based on sufficient human and animal inhalation studies.

## How can formaldehyde affect children?

A small number of studies have looked at the health effects of formaldehyde in children. It is very likely that breathing formaldehyde will result in nose and eye irritation. We do not know if the irritation would occur at lower concentrations in children than in adults.

# Formaldehyde

CAS # 50-00-0

There is some evidence of asthma or asthma-like symptoms for children exposed to formaldehyde in homes.

Animal studies have suggested that formaldehyde will not cause birth defects in humans.

## How can families reduce the risk of exposure to formaldehyde?

- Formaldehyde is usually found in the air, and levels are usually higher indoors than outdoors. Opening windows and using fans to bring fresh air indoors are the easiest ways to lower levels in the house. Not smoking and not using unvented heaters indoors can lower the formaldehyde levels.
- Formaldehyde is given off from a number of products used in the home. Removing formaldehyde sources in the home can reduce exposure. Providing fresh air, sealing unfinished manufactured wood surfaces, and washing new permanent press clothing before wearing can help lower exposure.

## Is there a medical test to show whether I've been exposed to formaldehyde?

Formaldehyde cannot be reliably measured in blood, urine, or body tissues following exposure. Formaldehyde is produced in the body and would be present as a normal constituent in body tissues and fluids.

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

The US EPA has determined that exposure to formaldehyde in drinking water at concentrations of 10 milligrams/liter (mg/L) for 1 day or 5 mg/L for 10 days is not expected to cause any adverse effects in children.

The US EPA has also determined that a lifetime exposure to 1 mg/L of formaldehyde in drinking water is not expected to cause any adverse health effects.

The Occupational Health and Safety Administration (OSHA) has limited workers' exposure to an average of 0.75 ppm for an 8-hour workday, 40-hour workweek.

The U.S. Department of Housing and Urban Development (HUD) has set standards for formaldehyde emissions in manufactured housing of less than 0.2 ppm for plywood and 0.3 ppm for particle board. The HUD standards are designed to provide an ambient air level of 0.4 ppm or less in manufactured housing.

## References

Agency for Toxic Substances and Disease Registry (ATSDR). 1999. Toxicological Profile for Formaldehyde. Addendum to the Profile for Formaldehyde. 2010. Atlanta, GA: U.S. Department of Public 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™ on the web: [www.atsdr.cdc.gov/toxFAQs](http://www.atsdr.cdc.gov/toxFAQs).

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.