



## What is formaldehyde?

Formaldehyde is a colorless, strong-smelling gas. Commonly known as a preservative in medical laboratories and mortuaries, formaldehyde is also found in other products such as chemicals, particle board, household products, glues, permanent press fabrics, paper product coatings, fiberboard, and plywood. It is also widely used as an industrial fungicide, germicide, and disinfectant.

Although the term formaldehyde describes various mixtures of formaldehyde, water, and alcohol, the term “formalin” more precisely describes aqueous solutions, particularly those containing 37 to 50 percent formaldehyde and 6 to 15 percent alcohol stabilizer.

## What should employers know about formaldehyde?

The OSHA standard that protects workers exposed to formaldehyde, *Title 29 of the Code of Federal Regulations (CFR) Part 1910.1048*, and equivalent regulations in states with OSHA-approved state plans apply to all occupational exposures to formaldehyde from formaldehyde gas, its solutions, and materials that release formaldehyde. The permissible exposure limits (PELs) for formaldehyde in the workplace covered by the standard are 0.75 parts formaldehyde per million parts of air (0.75 ppm) measured as an 8-hour time-weighted average (TWA). The standard includes a second PEL in the form of a short-term exposure limit (STEL) of 2 ppm that is the maximum exposure allowed during a 15-minute period. The action level—which is the threshold for increased industrial hygiene monitoring and initiation of employee medical surveillance—is 0.5 ppm when calculated as an 8-hour TWA.

## How can formaldehyde harm workers?

Formaldehyde is a sensitizing agent that can cause an immune system response upon initial exposure. It is also a suspected human carcinogen that is linked to nasal cancer and lung cancer. Acute exposure is highly irritating to the

eyes, nose, and throat and can make you cough and wheeze. Subsequent exposure may cause severe allergic reactions of the skin, eyes, and respiratory tract. Ingestion of formaldehyde can be fatal, and long-term exposure to low levels in the air or on the skin can cause asthma-like respiratory problems and skin irritation such as dermatitis and itching. Concentrations of 100 ppm are immediately dangerous to health or life.

## How can workers be exposed to formaldehyde?

Workers can inhale formaldehyde as a gas or vapor or absorb it through the skin as a liquid. They can be exposed during the treatment of textiles and the production of resins. Besides health care professionals and medical lab technicians, groups at potentially high risk include mortuary employees as well as teachers and students who handle biological specimens preserved with formaldehyde or formalin.

## What must employers do to protect workers from formaldehyde exposure?

Airborne concentrations of formaldehyde above 0.1 ppm can cause irritation of the respiratory tract. The severity of irritation worsens as concentrations increase.

Some of the key provisions of the OSHA standard require employers to do the following:

- Identify all employees who may be exposed to formaldehyde at or above the action level or STEL through initial monitoring and determine their exposure.
- Reassign employees who suffer significant adverse effects from formaldehyde exposure to jobs with significantly less or no exposure until their condition improves. Reassignment protection can continue for up to 6 months until the employee is determined able to return to the original job or unable to return to work—whichever comes first.
- Implement engineering and work practice controls to reduce and maintain employee exposure to formaldehyde at or below the 8-hour

TWA and the STEL. If these controls cannot reduce exposure to or below the PELs, you must provide your employees with respirators.

- Label all mixtures or solutions composed of greater than 0.1 percent formaldehyde and materials capable of releasing formaldehyde into the air at concentrations reaching or exceeding 0.1 ppm. For all materials capable of releasing formaldehyde at levels above 0.5 ppm during normal use, the label must contain the words “potential cancer hazard.”
- Train all employees exposed to formaldehyde concentrations of 0.1 ppm or greater at the time of initial job assignment and whenever a new exposure to formaldehyde is introduced into the work area. Repeat training annually.
- Select, provide, and maintain appropriate personal protective equipment. Ensure that employees use this equipment such as impervious clothing, gloves, aprons, and chemical splash goggles to prevent skin and eye contact with formaldehyde.
- Provide showers and eyewash stations if splashing is likely.
- Provide medical surveillance for all employees exposed to formaldehyde at concentrations at or above the action level or exceeding the STEL, for those who develop signs and symptoms of overexposure, and for all employees exposed to formaldehyde in emergencies.

### Are there any recordkeeping requirements concerning employee exposures?

Employers are required to do the following regarding employee exposure records:

- Retain employee exposure records for 30 years.
- Retain employee medical records for 30 years after employment ends.

- Allow access to medical and exposure records by current and former employees or their designated representatives upon request.

### How can you get more information on safety and health?

OSHA has various publications, standards, technical assistance, and compliance tools to help you, and offers extensive assistance through workplace consultation, voluntary protection programs, grants, strategic partnerships, state plans, training, and education. OSHA’s *Safety and Health Program Management Guidelines* (*Federal Register* 54:3904-3916, January 26, 1989) detail elements critical to the development of a successful safety and health management system. This and other information are available on OSHA’s website.

- For one free copy of OSHA publications, send a self-addressed mailing label to OSHA Publications Office, 200 Constitution Avenue N.W., N-3101, Washington, DC 20210; or send a request to our fax at (202) 693-2498, or call us at (202) 693-1888.
- To order OSHA publications online at [www.osha.gov](http://www.osha.gov), go to **Publications** and follow the instructions for ordering.
- To file a complaint by phone, report an emergency, or get OSHA advice, assistance, or products, contact your nearest OSHA office under the “U.S. Department of Labor” listing in your phone book, or call toll-free at **(800) 321-OSHA (6742)**. The teletypewriter (TTY) number is (877) 889-5627.
- To file a complaint online or obtain more information on OSHA federal and state programs, visit OSHA’s website.

This is one in a series of informational fact sheets highlighting OSHA programs, policies, or standards. It does not impose any new compliance requirements. For a comprehensive list of compliance requirements of OSHA standards or regulations, refer to *Title 29 of the Code of Federal Regulations*. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999. See also OSHA’s website at [www.osha.gov](http://www.osha.gov).