



MIOSHA Fact Sheet

General Industry Safety & Health Division

Hair Straightening Products and Formaldehyde

What is Formaldehyde?

Formaldehyde is normally a colorless, flammable strong-smelling gas. However, formaldehyde in hair products is usually found in a water-based solution. This solution can give off formaldehyde vapor (gas) over time and especially when heated. Formaldehyde in this solution may be referred to as “formalin” or “methylene glycol,” and could also contain alcohol as a stabilizer. Formaldehyde is used in a wide variety of cosmetics, including hair-straighteners.

How are stylists exposed to formaldehyde?

Stylists can inhale formaldehyde gas or vapor and absorb it through their skin when they’re applying liquid hair straighteners. Exposures can occur during the entire process, particularly when heat is applied, such as blow drying and flat ironing.

Manufacturers must properly label all mixtures and solutions greater than 0.1 percent formaldehyde and all materials that can release formaldehyde into the air at concentrations of 0.1 parts per million (ppm) or greater. Many hair straightening products state on their labels that they do not contain formaldehyde; however they may contain methylene glycol or a formaldehyde derivative. These chemicals can form and release formaldehyde gas or vapors, especially when they are heated. Material safety data sheets (MSDSs) must also identify the presence of release of formaldehyde in their products.

What are the hazards?

The World Health Organization (WHO) and the International Agency for Research on Cancer (IARC) classify formaldehyde as a human carcinogen, particularly in the nasal or throat cavities. Formaldehyde exposure is linked to leukemia and lung cancer.

Formaldehyde is a strong irritant and sensitizing agent and may affect the upper respiratory tract, skin, and eyes. Airborne concentrations of formaldehyde above 0.1 ppm may be irritating to some people. Formaldehyde can cause coughing and wheezing (asthma), dermatitis, and eye injuries. Eye injuries can range from tearing and discomfort to permanent damage. Previously exposed persons may react to a future formaldehyde exposure with an allergic reaction of the respiratory tract (asthma) or skin.

What must salons do if they use products that contain or release formaldehyde?

Assess employee exposure by air monitoring

According to the MIOSHA Formaldehyde Standard, Part 306, when using products that contain or release formaldehyde, employers must conduct air monitoring to identify all employees who may be exposed to formaldehyde at or above the action level (AL) or short-term exposure limits (STEL). Here are some air monitoring options:

- Purchase air monitoring equipment,
- Contract with an industrial hygienist,
- Contact the Consultation Education and Training (CET) Division of MIOSHA.

Air monitoring must also be done when employees report signs or symptoms of respiratory or skin conditions that are associated with formaldehyde exposure.

Understand the exposure limits

Part 306 sets the limits for airborne exposure:

- The permissible exposure limit (PEL) is 0.75 ppm. The PEL is based on an employee exposure averaged over an eight-hour period. Employers must ensure that employees aren’t exposed to formaldehyde at levels greater than the PEL.

- The AL is 0.5 ppm and it is also an employee exposure averaged over an eight-hour period. Employees exposed above this level must have ongoing air monitoring and be provided with medical surveillance.
- The STEL is 2 ppm. This is the average maximum exposure allowed during a 15-minute period. Employees exposed above this level must have ongoing air monitoring and be provided with medical surveillance.

Other organizations have recommended even stricter exposure limits. The American Conference of Governmental Industrial Hygienists (ACGIH) has a recommended ceiling limit of 0.3 ppm. A ceiling limit is one that cannot be exceeded at any time during the workday. The National Institute for Occupational Safety and Health (NIOSH) has a recommended ceiling limit of 0.1 ppm.

Educate and train employees

All employees exposed to solutions containing greater than 0.1 percent formaldehyde or to formaldehyde air concentrations of 0.1 ppm, must receive training. The training must occur at the time of their initial job assignment and be repeated annually. It must also occur whenever a new exposure to formaldehyde is introduced into the work area. Training must include:

- Contents of the formaldehyde standard,
- Overview of a medical surveillance program
- Health hazards, signs, and symptoms of formaldehyde exposure,
- Immediately report to the employer any signs or symptoms of exposure,
- Operations where formaldehyde is present,
- Work practices and engineering controls,
- Purpose, use, and limitations of personal protective equipment (PPE),
- Proper handling of spills or emergency situations,
- Location and availability of all training materials.

Reduce employee exposure

Employee exposure to formaldehyde must be reduced by the use of engineering or work practice controls if the PEL or STEL is exceeded.

Methods that can be used to reduce employee exposure are:

- If possible, **do not use** products that contain or could release formaldehyde vapors.
- Use engineering controls such as local exhaust ventilation to minimize employee exposures.
- Select, provide, and maintain appropriate personal protective equipment such as impervious clothing, gloves, aprons, and chemical splash goggles. Ensure that workers use this equipment to prevent skin and eye contact with formaldehyde.
- Provide showers and eyewash stations if splashing is likely.

Medical surveillance

Provide medical surveillance for all workers who:

- Are exposed to formaldehyde at concentrations at or above the AL or greater than the STEL.
- Develop signs and symptoms of overexposure.
- Are exposed to formaldehyde in emergencies.

Where can I find more information?

All manufacturers, importers, and distributors are required to identify formaldehyde on the MSDS for any product that contains more than 0.1 percent formaldehyde. This also applies to any product that can release formaldehyde at concentrations greater than 0.1 ppm. The MSDS must tell you why a chemical in the product is hazardous, how it can harm you, how to protect yourself, and what to do in an emergency. However, it appears that many hair-smoothing products containing formaldehyde releasing ingredients do not list formaldehyde on the label or on the MSDS.

For further information contact the MIOSHA Consultation Education and Training Division at (517) 322-1809 or on-line at www.michigan.gov/cet.

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