

Health Hazard Data

1. Acute Effects of Exposure to Formaldehyde

A. Ingestion (Swallowing).

(1) Swallowing liquids containing 10 to 40% formaldehyde will cause:

(a) Severe irritation and inflammation of the mouth, throat, and stomach;

(b) Severe stomach pains; and

(c) Possible loss of consciousness and death.

(2) Swallowing diluted formaldehyde solutions (0.03 – 0.04 percent) may cause severe discomfort in the stomach and mouth.

B. Inhalation (Breathing). Formaldehyde is highly irritating to the upper respiratory tract. Following are the concentration levels and associated health effects that may occur. Concentrations of:

(1) 0.1 to 3 ppm may irritate the eyes, nose, and throat of some individuals with some irritation detected at .01 ppm.

(2) 3 to 5 ppm causes tearing of the eyes and is intolerable to some people with some tearing detected at 0.9 ppm.

(3) 10 to 20 ppm causes difficulty in breathing, burning of the nose and throat, cough, and heavy tearing of the eyes.

(4) 25 to 30 ppm causes severe respiratory tract injury leading to pulmonary edema and pneumonitis.

(5) 100 ppm is immediately dangerous to life and health (IDLH). Employees should immediately evacuate areas suspected of containing high levels of formaldehyde. Exposure to such a high concentration may cause death.

C. Skin (Dermal). Formaldehyde is a severe skin irritant and a sensitizer. Contact with formaldehyde causes white discoloration, burning, drying, cracking, and scaling. Prolonged and repeated contact can cause numbness and hardening or tanning of the skin. Previously exposed people may react to future exposures with heightened sensitivity and resulting allergic eczematous dermatitis or hives.

D. Eye Contact. Formaldehyde solutions splashed in the eye can cause injuries ranging from transient discomfort to severe, permanent corneal clouding, and loss of vision. Severity of the effect depends on the concentration of formaldehyde in the solution and whether or not the eyes are flushed with water immediately after the accident.

2. Chronic Effects of Exposure

A. Carcinogenicity. The International Agency for Research on Cancer (IARC) has designated formaldehyde as a Category B carcinogen, which means it probably causes cancer in humans. Various animal experiments have conclusively shown formaldehyde to be a carcinogen in rats. In humans, formaldehyde exposure has been associated with cancers of the lung, nasopharynx, oropharynx, and nasal passages.

B. Mutagenicity. Formaldehyde is a weak mutagen. This means that irreversible effects to genetic material could occur, but the potential is very slight.

C. Toxicity. Prolonged or repeated exposure to formaldehyde may result in respiratory impairment. Rats exposed to formaldehyde vapor at 2 ppm developed benign nasal tumors and changes of the cell structure in the nose as well as inflamed mucous membranes of the nose. Structural changes in the epithelial cells in the human nose have also been observed. Some people have developed asthma or bronchitis following exposure to formaldehyde, most often as a result of an accidental spill involving a single exposure to a high concentration of formaldehyde.

3. Warning/Caution

It is harder to identify formaldehyde by odor and eye irritation as one becomes desensitized to formaldehyde vapor (olfactory fatigue). This can lead to overexposure if a worker is relying on formaldehyde's odor warning properties to alert him/her to potential exposure. Refer to the product-specific Material Safety Data Sheets (MSDS) for the type and strength of formaldehyde solution in use at your facility. The varying strengths and formaldehyde's use with additional hazardous chemicals may result in a variety of hazards that employees need to know about.