

# Work **Safe!** Bulletin

Bulletin No.: 147  
September 1992



## **FORMALDEHYDE**



Formaldehyde is a hazardous material to which many workers are exposed on a daily basis. It presents a high potential health hazard because it will destroy living tissue and is a suspected human carcinogen. Manitoba's Workplace Health Hazard Regulation (M.R. 53/88) classifies formaldehyde as a Designated Material. Therefore, any exposure of workers to formaldehyde, "shall be as close to zero as is reasonably practicable". Manitoba Regulation 52/88, The Workplace Hazardous Materials Information System (WHMIS) classifies formaldehyde as, "Combustible Liquid" and "Poisonous and Infectious Material - very toxic". The Occupational Exposure Limit (OEL) for formaldehyde is a ceiling of 0.3 parts of formaldehyde in one million parts of air (ppm).

### **AT RISK**

Exposure to formaldehyde may occur from working with:

**FORMALIN, METHANAL, METHYL ALDEHYDE, METHYLENE OXIDE, FORMIC ALDEHYDE, FORMOL and FORMALDEHYDE-BASED RESINS and GLUES.**

Occupations in which workers may be at risk of exposure to formaldehyde include: mortician, embalmer, physician, anatomist, pathologist, nurse, chemical and laboratory worker, student, woodworker (using particle board and plywood), formaldehyde resin or glue manufacture, and chemical sterilization of equipment or biohazardous material.

### **CHEMICAL PROPERTIES AND EFFECTS**

Formaldehyde is a gas with a strong, pungent odor. It is very soluble in water, and both the gas and the water solutions are colorless. Normal individuals are sensitive to formaldehyde:

1 ppm	- odor is detectable;
2-3 ppm	- noticeable irritation of the eyes, nose, throat and windpipe, which may produce a cough;
4-5 ppm	- tears form;
above 10 ppm	- breathing becomes difficult, severe burning sensations develop in the nose, throat and windpipe, and extreme tearing occurs;
50-100 ppm	- may cause pulmonary edema, pneumonitis and death.

Most people can not tolerate in excess of 10 ppm for more than a few minutes.

Chronic, long-term exposure to low, sub-acute levels of formaldehyde may cause respiratory irritation, obstruction of the airways, impaired lung function, allergic reactions and eczema. Repeated exposure, even at quite low concentrations, may cause sensitization in some individuals resulting in nasal or bronchial reactions such as chest tightness. Dermatitis is a common problem. Also, because formaldehyde is a "suspected human carcinogen", cancer is a cause for concern.

## **EXPOSURE CONTROL**

The preferred method of protecting workers from over exposure to formaldehyde is substitution with a safer product. Good protection can be achieved with a properly functioning ventilation system and/or isolation of the source. Any ventilation system for formaldehyde must ensure that no individual is exposed to a concentration exceeding 0.3 ppm. Where it is not possible or reasonably practicable to maintain a level of formaldehyde below 0.3 ppm, then work practices and procedures should be altered or, as a final option, personal protective equipment must be used to protect workers from exposure to formaldehyde.

## **PERSONAL PROTECTIVE EQUIPMENT**

Where engineering and work practice controls are ineffective in controlling exposure to formaldehyde, suitable protective equipment must be used.

Where there is a risk of exposure to the gas form of formaldehyde respiratory protection is required. Where respiratory protection is required there must be an appropriate respiratory program which meets the standards of CSA Z94.4-M1982, "Selection, Care and Use of Respirators" (available from the Canadian Standards Association, 50 Paramount Road, Winnipeg, Manitoba, R2X 2W3. Ph. 632 6633).

Where there is a risk of exposure to a liquid form of formaldehyde, appropriate protective clothing and equipment is required. Eye and face protection requires the use of approved chemical safety goggles or face shield. Skin protection requires the use of gloves, coveralls, boots and/or other clothing which is resistant to formaldehyde solutions. There must be available safety shower and eye-wash equipment conforming to ANSI Z358.1-1981, "Standard for Emergency Eyewash and Shower Equipment". (see Work Safe Bulletin No. 104.A).

## **DISPOSAL**

Formaldehyde is classified under the Manitoba Department of Conservation, Hazardous Waste Management Program as a hazardous waste. Therefore, it must be disposed of at an approved hazardous waste disposal site, and it can not be disposed into the city's sewer and waste system even if it is diluted. For further information on approved means of disposal contact Manitoba Department of Conservation, Hazardous Materials Program at 945-7094.