



Formaldehyde

The National Industrial Chemicals Notification and Assessment Scheme (NICNAS), the Australian government agency responsible for the regulation of industrial chemicals, published an assessment of the chemical formaldehyde in 2006. The NICNAS report found that workers in some industries were at risk of experiencing health effects from formaldehyde. This information sheet contains a summary of the main findings and recommendations of the report relevant to workers.

What is formaldehyde?

Formaldehyde is a colourless, flammable gas with a pungent odour. Water-based solutions containing dissolved formaldehyde, known as 'formalin', are used in -

- forensic/hospital mortuaries and pathology laboratories
- funeral (embalming) industry
- resins manufacture
- leather and fur tanning
- photographic film processing
- sanitising treatments
- lubricants
- analytical laboratories
- fumigation

Resins manufactured with formalin are used in -

- pressed wood manufacture
- paper and textile treatments
- fibreglass industry
- foam insulation
- foundry industry
- firelighter manufacture
- anti-graffiti wall sealer

The major use of formalin is in adhesives used in the manufacture of resins used to make pressed wood products, particularly particleboard and medium-density fibreboard. Another major use is in medicine-related laboratories where it is used to fix tissues and organs, and in the funeral industry, in embalming processes, where it functions as a disinfectant and preservative. Formaldehyde is also present at low concentrations as a preservative in a range of personal care and consumer products.

Formaldehyde is naturally produced during burning of organic matter and by a variety of natural biological and chemical processes. It is found in cigarette smoke, and is emitted from cooking and heating appliances such as gas stoves and heaters.

Health effects

Formaldehyde is toxic by inhalation, by skin contact, and by swallowing.

Breathing formaldehyde vapour can result in irritation of nerves in the eyes and nose, which may cause burning, stinging or itching sensations, a sore throat, teary eyes, blocked sinuses, runny nose, and sneezing. This health effect is commonly referred to as sensory irritation.

Skin contact with formalin solution or paraformaldehyde can cause skin rashes and allergic skin reactions. For the individual allergic to formaldehyde, even very low concentrations are likely to cause skin reactions. Splashes into the eyes can cause irritation, corrosion of the cornea, and possibly blindness.

Formaldehyde has been shown to cause nasal cancers in animals at levels not found in the majority of workplaces.

Formaldehyde is a highly reactive, flammable gas and can form explosive mixtures in air. It presents a fire hazard when exposed to flame or heat. Formaldehyde solutions can be flammable when formaldehyde or methanol concentrations in the solutions are high.

Formaldehyde is incompatible with many chemicals and can react, sometimes violently, with some chemicals, including strong oxidisers (e.g. bleach) and acids.

Workers identified as potentially at risk

Workers potentially at risk of experiencing health effects (sensory irritation) include embalmers, forensic/hospital mortuary workers, pathology laboratory workers, formaldehyde resin manufacturers, workers who repack raw formaldehyde or use it in the formulation of other products, and users of formaldehyde resins. Factors that can contribute to the greater risk of health effects in these industries are high concentrations of formaldehyde in the products that are handled; long exposure durations; high levels of manual handling of the products; and specific work processes such as weighing out, mixing in open tanks, cleaning and maintaining equipment, and heating and spraying products, which can generate vapour.

Recommendations for the protection of workers

- Replace high concentration formalin products with low concentrations or less hazardous or formaldehyde-free products, wherever possible.
- Effective ventilation is a key control measure for reducing exposure to formaldehyde. Ensure that a ventilation system is in place and is effective at maintaining exposure levels below the occupational exposure standard.
- Avoid skin contact with formaldehyde solutions.
- Follow relevant Australian standards and/or guidance from manufacturers in selection and use of personal protective equipment. Respirators should be used in situations where high formaldehyde levels and high frequency exposures may be encountered which may be above the occupational exposure standard.
- Avoid having to dilute formalin, by buying products with concentrations of formaldehyde appropriate for the intended use, where possible.
- Avoid spraying and brushing of formalin. Only spray formaldehyde where necessary and if both adequate engineering (e.g. local exhaust ventilation) and personal protective controls are in place.
- Manufacturers, suppliers and employers review MSDS, labels and training materials to take into consideration the changes in the health hazard classification of formaldehyde.

Occupational exposure standard

The current national occupational exposure standard for formaldehyde is 1 part per million (ppm) 8-hour time-weighted average (TWA) and 2 ppm short-term exposure limit (STEL). The NICNAS report recommends that the occupational exposure standard be lowered to 0.3 ppm 8-hour TWA and 0.6 ppm STEL. Formaldehyde has been shown to cause nasal cancers in animals at levels not found in the majority of workplaces.

The basis for lowering the current exposure standard is sensory irritation. The recommended exposure standards not only provide adequate protection against discomfort of sensory irritation, but also provide a high level of protection against cancer. The recommended standard is being considered by the Office of the Australian Safety and Compensation Council, the national agency responsible for setting national occupational exposure standards.

Workplace hazardous substances regulations

Workplace health and safety regulations exist in each State or Territory for hazardous substances. These regulations place duties on people including employers, suppliers, manufacturers in relation to hazardous substances used in the workplace. You should refer to the occupational health and safety authority in your particular State or Territory to find out the specific requirements.

Department of Consumer and Employment Protection

1260 Hay Street, PERTH, WA, 6005
Worksafe Division – 1300 30 78 77
safety@docep.wa.gov.au

Department of Employment and Industrial Relations

PO Box 820 LUTWYCHE QLD 4030
Workplace Health and Safety
Infoline 1300 369 915

Victorian WorkCover Authority

Advisory Service
GPO Box 4306
MELBOURNE VIC 3001
1800 136 089 or 03 9641 1444

WorkCover Authority of NSW

92-100 Donnison Street,
GOSFORD NSW 2250
02 4321 5000
WorkCover Assistance Service – 13 10 50
Hours: 8:30am- 5:00pm
Monday to Friday

Workplace Standards Tasmania

PO Box 56
ROSNY PARK , TAS, 7018
Phone: 03 6233 7657 (Outside Tasmania)
Local rate: 1300 366 322 (Inside Tasmania)
Fax: 03 6233 8338
Email: wstinfo@justice.tas.gov.au

Northern Territory Worksafe

Prevention Branch
GPO Box 4821 DARWIN NT 0801
Phone: 08 8999 5545

A.C.T. WorkCover

Level 3, Block B, Callam Offices
Easty Street
WODEN ACT 2606
Phone: 02 6205 0200
Fax: 02 6205 0336
Email: workcover@act.gov.au

SafeWork SA

Level 3
1 Richmond Road
KESWICK SA 5035
Phone: 08 8303 0400 or 1300 365 255
Fax: 08 8303 0277

FIRST AID FOR FORMALDEHYDE EXPOSURE

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| Inhaled | If inhaled, remove from contaminated area. Apply artificial respiration if not breathing. |
| Eye | In case of eye contact, hold eyelids apart and flush they eye continuously with running water. Continue flushing until advised to stop by Poisons Information Centre or a doctor, or at least for 15 minutes. |
| Skin | If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. |
| Swallowed | If swallowed do NOT induce vomiting |
| First Aid Facilities | Ensure eye bath and safety showers are available and ready for use. For advice, contact a Poisons Information Centre (131 126) or a doctor at once. |

Further information

More information can be found in the Material Safety Data Sheet available from the supplier.

A comprehensive source of information is the detailed assessment of formaldehyde published by the National Industrial Chemicals Notification and Assessment Scheme (NICNAS). This is available free of charge on the NICNAS web site at <http://www.nicnas.gov.au/Publications/CAR/PEC/PEC28.asp>, or by calling 1800 638 528.

More information on the use of industrial chemicals can be found at the NICNAS web site: www.nicnas.gov.au