

# FORMALDEHYDE INFOSHEET

Formaldehyde solution (formalin) is widely used across campus, notably for specimen storage. Formaldehyde is a colourless gas with a strong, pungent odour, but it is often used in the aqueous form. Formalin is normally supplied as a 37% solution with water and methanol. Paraformaldehyde, a white crystalline powder, is a flammable solid that can be used to prepare formaldehyde solutions.

## HAZARD

Formaldehyde has multiple acute and chronic health hazards, including the potential to cause sensitisation and cancer. Effective procedures must be established to prevent exposure.

Time weighted average (TWA) exposure standard      1 ppm (1.2 mg/m<sup>3</sup>)

Short term exposure limit (STEL)                      2 ppm (2.5 mg/m<sup>3</sup>)

A 2006 [NICNAS report](#) recommends that the occupational exposure standard be lowered to 0.3 ppm TWA (8 hr) and 0.6 ppm STEL.

## GHS CLASSIFICATION

Formaldehyde solutions vary in toxicity dependant on concentration. Below is GHS classification information for a 37% solution of formaldehyde in water and methanol.

Skin Sensitization: Category 1



Flammable liquid: category 3



Specific target organ systemic toxicity  
(single exposure): Category 1



Acute Toxicity -Inhalation, Oral, Skin:  
Category 3



Carcinogenicity: Category 2



Skin corrosion/irritation : Category 1B

## DANGEROUS GOODS CLASSIFICATION

Flammable liquid



Corrosive



The [International Agency for Research on Cancer \(IARC\)](#) classifies formaldehyde as a known human carcinogen (Group 1). Formaldehyde is also a Schedule 6 poison.

Formaldehyde reacts with hydrochloric acid to produce bis (chloromethyl) ether, a very potent carcinogen.

## MANAGEMENT

### PROCUREMENT

- Actively seek to eliminate the use of formaldehyde. Consider alternate chemicals and processes.
- Order the smallest volume and lowest concentration possible for the required purpose.

### HANDLING

- Always assess the risk of exposure.
- Document the risk assessment and safe work procedure, include emergency response in the event of an exposure or spill.
- Train users in the safe work procedure and ensure that this procedure is followed.

### Considerations for the development of safe work procedures:

- Formaldehyde solutions > 4% should always be used in a fume cupboard. Re-circulating clean benches, laminar flow cabinets or bio-safety cabinets are not appropriate for the use of formaldehyde. Ensure that a local area exhaust ventilation system is effective in maintaining exposure levels below the occupational exposure standard.
- Half face respirators and cartridge filters are available for formaldehyde, but are not a replacement for effective ventilation. Respirators with formaldehyde specific cartridges should be included in a spills kit in areas where large volumes formaldehyde is routinely used.
- Always use safety goggles when handling higher concentrations of formaldehyde solution to minimise the risk of a splash or vapour exposure to the eyes.
- Medium or heavyweight nitrile, neoprene, natural rubber, or PVC gloves should be worn when handling concentrated formaldehyde. Disposable nitrile gloves may be used for dilute solutions (4%).
- Preparations can be made over plastic backed bench coats with immediate disposal when the task is completed.
- Label all formaldehyde solutions clearly with the chemical name and GHS hazards.
- Place formaldehyde waste in a labelled, chemically compatible container with a sealed lid and dispose of through the University hazardous waste program with the waste type "liquid-formaldehyde solution".
- Always wash hands thoroughly after using formaldehyde, even if gloves are worn.
- Ensure workers have access to eye wash facilities and a safety shower.

### STORAGE

- Store formaldehyde solutions in labelled, chemically compatible containers, away from heat.
- Always place large volume containers on a low shelf.
- Use secondary containment for volumes greater than 1 L.
- Do not store formaldehyde bottles in any area where a leak could flow to a drain.

### EMERGENCY AND FIRST AID RESPONSE

#### Spills

Small spills can be absorbed with a chemical spill pad, sealed in a plastic bag and disposed of as hazardous waste.

Larger spills (>250mL) outside of a fume cupboard pose a risk of exposure by inhalation.

1. Evacuate the area
2. Prevent anyone entering the area
3. a. Arrange clean-up by trained staff using appropriate respiratory protection
3. b. Call Triple Zero (000) and Security (9351 3333) and ensure that the staff involved are available to assist the emergency services.

#### First Aid

- If someone inhales a formaldehyde vapour, immediately move the person to fresh air. If the person is having trouble breathing, dial triple zero (000).
- For eye or skin exposure, immediately flush with plenty of water for at least 15 minutes. Remove contaminated clothing.
- Report any exposure as soon as possible to your supervisor.