UCI Environmental Health & Safety

Formaldehyde Program

Responsible Administrator: Name
Revised: July 2020

Summary: This document applies to all UC Irvine research and staff support personnel where potential exposure to formaldehyde exists.

1. Program Description 1
2. Scope 1
3. Definitions 1
4. Responsibilities 2
5. Program Components 3
6. Reporting Requirements 7
7. References 7

1. Program Description

The purpose of the UCI Formaldehyde Program is to minimize or control formaldehyde exposure to prevent potential health effects from occupational exposure to formaldehyde and/or formalin by:

- Conducting exposure assessments and monitoring
- Establishing safe handling practices and controls to minimize exposure
- Providing health hazard information and training
- Maintaining an employee medical surveillance program

2. Scope

This document applies to all UC Irvine research and staff support personnel where potential exposure to formaldehyde exists.

UCI's Formaldehyde program addresses:

- Exposure assessments and monitoring
- Regulated areas
- Hazard Communication
- Engineering Controls
- Protective Equipment
- Housekeeping
- Employee medical surveillance
- Emergencies
- Recordkeeping
- Reporting

3. Definitions

Permissible Exposure Level (PEL) – Airborne concentration set by Cal/OSHA of 0.75 part formaldehyde per million parts of air (0.75 ppm) calculated as an 8-hour time weighted average (8-HR TWA). The PEL is a concentration that nearly all workers may be exposed to daily during a 40-hour workweek for a working lifetime without adverse effect. Exposures exceeding the PEL or STEL trigger the initiation of:

- Regulated areas that require controlled access and warning posters
- Training (annual)
- Use of respiratory protection
- Implementation of work practices and engineering controls to lower exposure below the PEL as feasible
- Employee medical surveillance
- Exposure monitoring (every 6 months)

Short Term Exposure Level (STEL) – Airborne concentration set by Cal/OSHA of 2 parts formaldehyde per million parts of air (2.0 ppm) calculated as a 15-minute time weighted average (15-min TWA). The STEL should not be exceeded at any time during the workday. Exposures exceeding the STEL or PEL trigger the initiation of:

- Regulated areas that require controlled access and warning posters
- Training (annual)
- Use of respiratory protection
- Implementation of work practices and engineering controls to lower exposure below the STEL as feasible
- Employee medical surveillance
- Exposure monitoring (annual)

Action Level (AL) – Airborne concentration set by Cal/OSHA of 0.5 part formaldehyde per million parts of air (0.5 ppm) calculated as an 8-hour time-weighted average (8-HR TWA). Exposures at or above the AL trigger the initiation of:

- Employee medical surveillance
- Exposure monitoring (every 6 months)

Regulated Area – Any area where the airborne concentration of formaldehyde exceeds either the PEL or STEL. Access is restricted to trained (see Section VIII) authorized personnel.

4. Responsibilities

4.1. Supervisors are responsible for:

- Notifying EH&S when formaldehyde containing materials are in use in the area
- Updating chemical inventories routinely to reflect formaldehyde use.
    - At this time May 2020, the campus is transitioning to a new online inventory system, UC Chemicals, https://ehs.ucop.edu/chemicals/. Until the migration of every campus inventory is complete, please update your inventory annually with your current inventory system (UC Chemicals, https://ehs.ucop.edu/chemicals/, CiBR-Trac, http://ucirvine.ecompliance.net/index.jsp, or CBIS (Chem Innovations), https://cheminnovation.ps.uci.edu/Cbis/Login.aspx?ReturnUrl=%2Fcbis%2FUci%2FCbisHome.aspx).
- Ensuring that employees receive and understand the Safety Data Sheet for formaldehyde
- Completing required training and ensuring that employees handling formaldehyde complete the required training. Register for required training at http://www.uclc.uci.edu/ for the following courses:
    - Formaldehyde Safety training (online course)
    - Laboratory Safety Training (lab workplace) or Safety Training (non-lab workplace).
        - Basic Laboratory Safety Training
            - UC Laboratory Safety Fundamentals
            - Hazardous Waste

        - Hazardous Materials Incidents Emergency Procedures Training
    - Respiratory Protection (if applicable)
- Ensuring that safe handling practices and exposure controls such as ventilation and/or personal protective equipment are used by employees
- Reporting any symptoms of formaldehyde exposure experienced by employees to EH&S

4.2. Employees are responsible for:

- Reviewing the formaldehyde SDS with their supervisor prior to handling the material
- Completing required training (http://www.uclc.uci.edu/):
    - Formaldehyde Safety training (online course)
    - Laboratory Safety Training (lab workplace) or Safety Training (non-lab workplace)
        - Basic Laboratory Safety Training
            - UC Laboratory Safety Fundamentals
            - Hazardous Waste
            - Hazardous Materials Incidents Emergency Procedures Training
    - Respiratory Protection (if applicable)
- Using safe handling practices and exposure controls such as ventilation and/or personal protective equipment
- Reporting any symptoms of formaldehyde exposure to their supervisor and EH&S immediately

4.3. EH&S is responsible for:

- Conducting exposure assessments and monitoring for operations involving potential exposure to formaldehyde.
- Recommending safe handling practices and exposure controls such as ventilation and/or personal protective equipment
- Ensuring that health hazard information and training are readily available
- Facilitating the initiation of employee medical surveillance if the Action Level or STEL is exceeded
- Implementing the provisions of the Cal/OSHA formaldehyde standard, California Code of Regulations, Section 5217

5. Program Components

5.1. Exposure Limits & Requirements Summary

Formaldehyde Airborne Level	Type of Limit	Exposure Duration	CAL-OSHA Requirements
At or above 0.1 ppm	Exposure Threshold	Any period of time	• Annual formaldehyde training
At or above 0.5 ppm	"Action" Level (AL)	8-hour time weighted average	Same as above plus: • Employee medical surveillance • Periodic exposure monitoring
At or above 0.75 ppm	Permissible Exposure Limit (PEL)	8-hour time weighted average	Same as above plus: • Establish and Post Regulated Areas

At or above 2.0 ppm	Short-Term Exposure Limit (STEL)	15 minute time weighted average	• Use respiratory protection • Implement work practice and engineering controls to lower exposure below the PEL and STEL as feasible

5.2. Exposure Monitoring

(1) Initial monitoring will be performed in areas where there is potential for employees to be exposed at or above the Action Level or at or above the STEL.

(2) This monitoring will be repeated each time there is a change in production, equipment, process, personnel, or control measures which may result in new or additional exposure to formaldehyde.

(3) If the initial monitoring determines that the employee is exposed at or above the Action Level, monitoring will be repeated at least every 6 months.

(4) If the last monitoring determines that the employee is exposed at or above the STEL, monitoring will be repeated at least once a year under worst conditions.

(5) Periodic monitoring may be discontinued if results from two consecutive sampling periods taken at least 7 days apart show the employee exposure is below the AL and the STEL.

(6) Within 15 days of receiving the results, EH&S will notify the affected employees and supervisors of the results.

(7) Representative samples for each job classification in each work area shall be collected for each shift.

5.3. Labeling Containers of Formaldehyde

All containers of formaldehyde, at any concentration, must be labeled. This label must include, at a minimum:

DANGER
FORMALDEHYDE-CONTAMINATED
(CLOTHING)
EQUIPMENT MAY
CAUSE CANCER
CAUSES SKIN, EYE, AND RESPIRATORY IRRITATION
DO NOT BREATHE VAPOR DO NOT GET ON SKIN

1. If the container also has a specimen of other potentially infectious material, it must also be labeled “BIOHAZARD”.

2. Containers must be kept closed at all times to reduce the formaldehyde vapors in the air.

5.4. Regulated Areas

1. Posting -In areas where the concentration exceeds the PEL or the STEL, signs will be posted at all entrances with the following information:

DANGER
FORMALDEHYDE
MAY CAUSE
CANCER
CAUSES SKIN, EYE, AND RESPIRATORY IRRITATION
AUTHORIZED PERSONNEL ONLY

2. Access - Only authorized personnel who have been trained to recognize the hazards of formaldehyde (refer to Section VIII of this document) will be allowed to access these areas.

5.5. Engineering Controls

Where feasible, general and local exhaust ventilation systems such as laboratory hoods, down draft systems, air curtains, and snorkels must be used to reduce and maintain employee exposures to formaldehyde at or below the PEL and the STEL.

5.6. Work Practice Controls

Work practices that reduce the source of exposure or minimize the potential for formaldehyde to become airborne must be implemented whenever possible.

5.7. Emergency Equipment

There must be an emergency eyewash and shower in the work areas when there is the potential for splashing.

5.8. Personal Protective Equipment

5.8.1. Hand Protection - Butyl gloves are recommended when handling 37% or greater concentration of formaldehyde mixed with phenol, or when immersion of the hands is anticipated.

- Disposable nitrile gloves (8 mils thick) can be used when solely handling formaldehyde or formalin solutions.
- Users must consult with glove manufacturer's permeation guide charts to ensure proper glove selection.

5.8.2. Eye Protection - Goggles with a face shield and chemical resistant apron must be worn when formaldehyde is being poured or when there is potential for splashing.

5.8.3. Respiratory Protection - If monitoring shows that PEL or STEL is exceeded, the employee will be required to wear a full-face respirator with formaldehyde cartridges, until the exposure levels can be reduced with engineering controls or work practices.

- When air purifying respirators are used, the cartridges must be replaced after three (3) hours of use, or at the end of the work-shift, whichever is sooner, unless the cartridge contains a NIOSH approved end-of-service indicator to show when breakthrough occurs.

5.8.4. Protective Clothing – Protective clothing must be used to prevent formaldehyde exposure and is provided at no cost to the employee.

- Contaminated protective clothing and equipment must be decontaminated prior to reuse. No contaminated clothing may be taken home.
- Disposable clothing that is impermeable to liquids may be used and disposed of as hazardous waste if contaminated with any chemicals. Disposable clothing

may not be reused.

- Containers for contaminated clothing and equipment shall have labels and signs containing the following:

DANGER
FORMALDEHYDE-CONTAMINATED
(CLOTHING)
EQUIPMENT MAY
CAUSE CANCER
CAUSES SKIN, EYE AND RESPIRATORY IRRITATION
DO NOT BREATHE VAPOR DO NOT GET ON SKIN

- Any personnel who launders, cleans or repairs clothing and equipment shall be notified of formaldehyde's potentially harmful effects and procedures to prevent exposure and safely handle contaminated equipment.

5.9. Housekeeping

Preventative maintenance of equipment must be undertaken to provide periodic inspection of equipment and to minimize accidental chemical spills or leaks.

5.10. Spills

All spills must be cleaned up promptly. Spill equipment should be readily available to clean up small incidental spills (dilute solutions and less than 100 milliliters). All personnel handling incidental spills of dilute formaldehyde solutions must be properly trained. Contact EH&S for training information on spill kits and clean-up procedures.

If a spill is large:

i. Employees are not to clean it up.
ii. Immediately evacuate the area, and close any doors.
iii. Alert others not to enter the area.
iv. Contact EH&S at 949-824-6200 for assistance in cleaning up the spill.
v. Do not reenter the area until the area has been monitored by EH&S.

Formaldehyde contaminated waste and debris resulting from spills must be disposed of through EH&S as hazardous waste.

5.11. Medical Surveillance

5.11.1. Medical surveillance is required for all employees:

- exposed to formaldehyde at or above the Action Level or exceeding the STEL (annually)
  - who develop signs and symptoms of overexposure to formaldehyde,
  - who require the use of respirators
  - and for all employees exposed to formaldehyde during emergencies.

5.11.2. If an employee requires medical surveillance, EH&S will notify the employee and facilitate enrollment in a medical surveillance program.

5.11.3. If the employee has developed signs and symptoms related to formaldehyde exposure, they should seek medical attention immediately and notify their supervisor and EH&S

at 949-824-6200.

5.11.4. The examination shall include a medical and work history, physical examination and pulmonary function test in accordance with the provisions under California Code of Regulations, Title 8, Section 5217, (l) Medical Surveillance. An employee work history and copy of the standard and Appendices A, C, D, and E shall be provided to the examining physician.

5.11.5. Where medical removal or restrictions are recommended by a physician, the employee may seek a second opinion. Employee medical removal protection benefits must comply with the California Code of Regulations, Title 8, Section 5217, (l) Medical Surveillance.

5.12. Record Retention

1. Exposure records will be kept for 30 years
2. Medical records will be kept for the duration of employment plus 30 years.
3. Respirator fit testing records will be kept until replaced by a more recent record.
4. Records are available upon request to the employee or his/her designated representative for inspection and copying.

6. Reporting Requirements

Reports or use will be issued by EH&S in accordance with the California Code of Regulation, Title 8, Section 5203 when applicable. (https://www.dir.ca.gov/title8/5203.html)

7. References

California Code of Regulations, Title 8, Section 5217 Formaldehyde. (https://www.dir.ca.gov/title8/5217.html)