



DIVISION OF MATHEMATICS, SCIENCE & ENGINEERING

Formaldehyde Safety Program

Updated March, 2014

A. PURPOSE

1. The purpose of this program is to protect employees from the hazards associated with formaldehyde (HCHO) and to maintain formaldehyde exposures below the regulatory limits.

B. SCOPE

1. This program applies to all Departments within the Science/Mathematics (SM) building that use formaldehyde or other formaldehyde-containing solutions.

C. RESPONSIBILITIES

1. South Orange County Community College District (SOCCCD) Risk Management Department is responsible for:
 - Program development and implementation at the College.
 - Monitoring compliance with the OSHA Standard-29 CFR 1910.1048 and Cal-OSHA 8CCR 5217.
 - Providing general Formaldehyde Safety training annually for all employees who may be exposed to formaldehyde.
 - Conducting exposure assessments and evaluating exposure control measures, as necessary.
 - Providing or coordinating emergency response for chemical spills.
 - Investigating accidents.
 - Maintaining employee exposure records.
2. Dean and Department Heads are responsible for:
 - Ensuring departmental compliance with all the procedures outlined in this program.
3. Supervisors' (Instructors, Dean, or designee) responsibilities include:
 - Ensuring compliance with this program in their work area(s).
 - Developing Standard Operating Procedures (SOP) that address the specific safety measures to be implemented when using formaldehyde.
 - Coordinating the provision of medical examinations, exposure monitoring, and record keeping, as required.
 - Ensuring employees with potential exposure to formaldehyde receive the appropriate training before working with it.
 - Arranging for immediate emergency response, if necessary, for chemical spills, injuries, and overexposures.
 - Maintaining a MSDS for the formaldehyde products used and all other hazardous chemicals in the work area.
 - Notifying the District Risk Management Department when there is a change in equipment, processes, or controls that may result in additional exposure to formaldehyde.

4. Employees/students are required to:
 - Know the provisions of the Formaldehyde Safety Program.
 - Report accidents, possible over-exposures, or unsafe conditions to their supervisor.
 - Wear Personal Protective Equipment and utilize engineering controls when recommended and provided.

D. HAZARD DATA

1. Formaldehyde may affect the body through inhalation, skin or eye contact, or accidental ingestion. Eye irritation and sense of smell may become less sensitive with time as you adapt to formaldehyde; therefore, you cannot rely on formaldehyde's warning properties to alert you to the potential for overexposure.

2. Acute Health Effects

- **Inhalation.** Formaldehyde is highly irritating to the upper respiratory tract and eyes. Severity of the symptoms depends upon its concentration in the air.

0.5 to 2.0 ppm	May irritate eyes, nose, throat
3 to 5 ppm	May cause irritation and tearing of the eyes
10 to 20 ppm	Causes difficulty breathing, burning nose and throat, coughing, and heavy tearing of the eyes
25 to 30 ppm	Causes severe respiratory tract injury leading to pulmonary edema and pneumonitis
100 ppm	Immediately dangerous to life and health

- **Skin Absorption.** Formaldehyde is a severe skin irritant and sensitizer. Contact with formaldehyde causes white discoloration, drying, cracking, and scaling. Prolonged and repeated contact can cause numbness or hardening of the skin. Previously exposed persons may react to future exposure with an allergic eczematous dermatitis or hives.
- **Eye Contact.** Formaldehyde solutions splashed in the eyes can cause injuries ranging from transient discomfort to severe, permanent corneal clouding and loss of vision. The severity of the injury depends on the concentration of formaldehyde and whether or not the eyes were flushed with water (minimum of fifteen minutes) immediately after the accident.
- **Ingestion.** 10% to 40% solutions of formaldehyde can cause severe irritation of the mouth, throat, and stomach. Severe stomach pains will follow ingestion, with possible loss of consciousness and death. Ingestion of dilute solutions (0.03%-0.04%) may cause discomfort in the stomach and throat.

3. Chronic Health Effects

- Formaldehyde has the potential to cause cancer in humans. Repeated and prolonged exposure increases this risk. In humans, formaldehyde exposure has been associated with cancers of the lung, nasopharynx and oropharynx, and nasal passages. Prolonged or repeated exposure to formaldehyde may result in respiratory impairment. Some people have developed asthma or bronchitis following exposure to formaldehyde, usually after a single exposure to a high concentration. Scientific evidence exists in which formaldehyde has been shown to cause genetic alterations.

4. Physical Hazards

- Formaldehyde poses a moderate fire and explosion hazard when exposed to heat or flame.

E. PERMISSIBLE EXPOSURE LIMITS

1. OSHA has issued the following guidelines for employee exposures to reduce the potential for adverse health effects:

- Action Level. The concentration of formaldehyde in the air, calculated as an eight-hour, time-weighted average, which initiates certain required activities such as exposure monitoring and medical surveillance. **The action level for formaldehyde is 0.5 parts per million (0.5 ppm).**
- Permissible Exposure Limit (PEL). The greatest concentration, calculated as an eight-hour, time-weighted average, which nearly all workers may be repeatedly exposed during their eight-hour work shift without experiencing adverse health effects. **The PEL for formaldehyde is 0.75 parts per million (0.75 ppm).**
- Short Term Exposure Limit (STEL). Without experiencing adverse health effects, the greatest concentration to which nearly all workers may be exposed during any fifteen-minute period. **The STEL for formaldehyde is 2 parts per million (2 ppm).**

F. EMPLOYEE EXPOSURE ASSESSMENTS

1. Air Monitoring

- Whenever formaldehyde is used in a work area, the District Risk Management, or designee, will conduct air monitoring to determine employee exposures. Measurements of employee exposures will be representative of a full shift or STEL and will be taken for each job classification in each work area.
- If employee exposures are found to be at or above the action level, the District Risk Management, or designee, will repeat air monitoring every six (6) months. If exposures are above the STEL, air monitoring will be conducted at least once per year. Monitoring will continue until exposures can be reduced below these levels by engineering or administrative controls.
- Air monitoring will be conducted promptly in a work area if employees are experiencing signs or symptoms of formaldehyde exposure. Air monitoring will be repeated in an area each time there is a change in equipment, processes, or controls that may result in additional exposure to formaldehyde. The District Risk Management must be notified to conduct this monitoring.

G. REDUCING EMPLOYEE EXPOSURE TO FORMALDEHYDE

1. Substitution
 - When possible, substitution of a less hazardous chemical or process will be used to reduce or eliminate formaldehyde exposures.
2. Engineering Controls
 - When possible, chemical fume hoods and/or local exhaust ventilation will be used to reduce exposures to formaldehyde. Local exhaust is used to capture and exhaust formaldehyde vapors, preventing high exposures in the employee's breathing zone.
3. Administrative Controls
 - If engineering controls cannot be implemented, alteration of work practices will be used to reduce exposures to formaldehyde. This could include limiting the amount of time employees spend working in high exposure areas by rotating personnel.
4. Personal Protective Equipment (PPE)
 - Contact with the eyes or skin with liquids containing 1% or more formaldehyde will be prevented by the use of protective garments and equipment that are impervious to formaldehyde. The type of PPE necessary will vary depending on the concentration, amount used, and the potential for splashing, and may include goggles, face shields, gloves, gowns, lab coats, aprons, and arm sleeves. The District Risk Management, or designee, can provide guidance on the appropriate PPE for each particular area.
 - Prior to each use, employees must inspect all PPE. After use, PPE must be stored in a sanitary manner.
5. Respirators
 - If employee exposures are found to exceed the PEL or STEL, respirators will be provided until feasible engineering or administrative controls can be implemented. Based on air monitoring results, the District Risk Management, or designee, will determine respirator use and type. If respirator use is necessary, employees must be medically cleared by the District Risk Management, or designee, to wear a respirator and be fit-tested and trained by the District Risk Management before using a respirator.
 - In areas where the formaldehyde concentration is unknown or greater than 75 ppm, full body protective clothing and self-contained breathing apparatus (SCBA) are required. This concentration may be encountered during a large quantity spill of formaldehyde. **Currently, no District or College personnel are trained to handle this type of situation; 911 must be contacted in these situations.**
 - Prior to each use, employees must inspect their respirator. Respirators must be stored in a sanitary manner. Supervisors should inspect respirators each month to ensure they are being used, cleaned, and stored properly.
6. Hygiene
 - To prevent the accidental ingestion of formaldehyde, **eating, drinking, and smoking** are prohibited in areas where formaldehyde is used. In addition, employees must wash their hands after using formaldehyde.

7. Emergency Eyewash and Shower

- If there is a possibility that employees’ skin may be splashed by formaldehyde-containing solutions, an emergency shower or drench hose will be provided in the work area. If there is a possibility that employees’ eyes may be splashed by formaldehyde-containing solutions, a plumbed eyewash station will be provided in the work area.
- Employees must be instructed on the proper use of the eyewash and emergency showers. If an employee’s eyes or skin are splashed by formaldehyde-containing solutions, the employee must flush them immediately and continue flushing for fifteen minutes. The employee should then seek medical attention by following the instructions on the District’s “Protocol for Injuries” policy.

H. SIGNAGE AND LABELING

1. Regulated Areas

- Areas where the airborne levels of formaldehyde are found to exceed the PEL will be regulated areas. Access to these areas will be limited to persons trained to recognize the hazards of formaldehyde. All entrances and access ways will be posted with signs bearing the following information:

DANGER
Formaldehyde
Irritant and Potential Cancer Hazard
Authorized Personnel Only

2. Container Labels

- If a chemical product containing greater than 1% formaldehyde is transferred into a container other than the original, it must be labeled with the following information:

Small Containers:

CAUTION
Contains Formaldehyde
Potential Cancer Hazard

Large Containers

CAUTION
Contains Formaldehyde
Toxic if inhaled or swallowed
Potential Cancer Hazard
May cause respiratory sensitization
Irritating to eyes, skin, and respiratory system

- The District Risk Management, or designee, will provide these labels upon request. When labeling containers using the District’s labeling policy, use the following hazard ratings: **Health-3; Flammability-2; Reactivity-0; and Personal Protective Equipment**-this will vary based on the use and must be at least a B. *Refer to the District Risk Management’s Hazard Communication Program for more information.*

I. STANDARD OPERATING PROCEDURES

1. Working with formaldehyde requires a written Standard Operating Procedure (SOP) that addresses the following:
 - The hazards of formaldehyde.
 - The containment devices (i.e., chemical fume hoods, glove boxes) that will be used when working with formaldehyde.

- The Personal Protective Equipment that is required when working with formaldehyde.
- Designated storage and use areas.
- How to dispose of formaldehyde solutions waste.
- Decontamination procedures.

J. EMPLOYEE INFORMATION AND TRAINING

1. Every employee working with formaldehyde must receive annual training of the hazards of formaldehyde. A training module will be provided to supervisors with employees working with formaldehyde. Supervisors should review this information with employees annually. It will cover the following:
 - Requirements of the Standard.
 - Explanation of the District's Formaldehyde Safety Program.
 - Contents of the Material Safety Data Sheet for formaldehyde.
 - Description of the medical surveillance program.
 - Description of the health hazards associated with exposure.
 - Signs and symptoms of exposure.
 - Instructions to report any signs or symptoms that may be attributable to formaldehyde exposure.
 - Description of the operations in the work area where formaldehyde is present.
 - Work practices to reduce exposure, including engineering and administrative controls and Personal Protective Equipment required.
 - Instructions for handling spills and emergency procedures.
2. This training must be conducted annually or whenever a new hazard is introduced into the work area, when the employee transfers to another job, and whenever the employee demonstrates behavior that indicates a lack of understanding of the safe handling of chemicals.
3. Supervisors are responsible for ensuring that employees with potential exposure to formaldehyde receive the appropriate training before working with it. To ensure that supervisors are knowledgeable of their training responsibilities, the District Risk Management, or designee, will conduct training modules for all supervisors.
4. The individual presenting the training session must document all training and a copy of the training records will be submitted to the District Risk Management.

K. MEDICAL SURVEILLANCE

1. Employees found to have exposures that exceed the action level or the STEL will be included in a medical surveillance program. These employees will fill out a medical questionnaire annually and receive a physical examination if the District Risk Management, or designee, determines it is necessary based on the questionnaire. Employees exposed to formaldehyde will be provided with the opportunity to receive medical attention under the following circumstances:
 - Whenever an employee has developed signs or symptoms associated with exposure to formaldehyde.
 - Whenever an employee is involved in a spill, leak, or other occurrence resulting in a possible overexposure to formaldehyde.

- Employees may obtain free medical consultation regarding concerns about formaldehyde exposures.
- It is the intent of the District to provide a work environment that does not compromise the reproductive health of any employee or student, regardless of gender, or the health of a fetus.
- Employees, who are required to wear respirators as determined by the District Risk Management, must be medically cleared by the District to use a respirator.

2. Medical Removal

- Employees experiencing significant irritation of the eyes, upper airways, or skin, or respiratory or dermal sensitization attributed to formaldehyde exposure will be seen by the District Risk Management, or designee. If the District Risk Management, or designee, determines that the symptoms may be the result of a possible overexposure, the District Risk Management, or designee, will evaluate the work area to determine if further control measures are necessary. If the employee's symptoms have not subsided within a two-week period and the District Risk Management, or designee, has determined that the employee was sensitized, restrictions or transfer from the work area may be recommended.

L. SPILLS

1. Small Spills

Small spills (<200 ml of 5% or less formaldehyde, <30 ml of greater concentrations) can be cleaned up with absorbent material. The appropriate Personal Protective Equipment, such as safety glasses and formaldehyde resistant gloves, must be used to prevent skin contact with the formaldehyde. The spill clean-up materials must be double-bagged, tightly closed, correctly labeled, and picked up by the District Risk Management, or designee, for disposal. If you experience any eye or upper respiratory irritation while cleaning up the spill, stop immediately and call 911 for assistance. Campus Police will contact District Risk Management to assist with clean-up.

2. Large Spills

Employees should not attempt to clean up large quantity spills of formaldehyde. In the event of a large spill, evacuate the area and call 911. If an area contains large quantities of formaldehyde, procedures to be followed in the case of an emergency must be included as part the Standard Operating Procedures for formaldehyde in that area. *Refer to the District's Chemical Spill Response Program for more information.*

M. DISPOSAL

1. All chemical waste must be disposed of according to the District's Hazardous Chemical Waste Program. This document must be referenced before any chemical is disposed of into the trash, sewer system, or allowed to evaporate. *When in doubt, contact the District Risk Management for clarification.*

N. STORAGE

1. Ideally, formaldehyde should be stored in a well-ventilated cabinet in an unbreakable, chemically-resistant, secondary container to contain spills. The storage area should exhibit a sign warning of the hazard of formaldehyde. Formaldehyde should not be stored with acids or oxidizing agents. *Refer to the District's Chemical Storage Program for more details.*

O. PRESERVED SPECIMANS

1. Specimens that are preserved in formaldehyde/formalin and are used in Biology labs include, but are not limited to the following:
 - All Small Invertebrate (specimens are re-used each semester)
 - Dogfish Shark
 - Dogfish Shark, Pregnant
 - Lamprey (specimens are re-used each semester)
 - Necturus
 - Perch
 - Sheep Brain
 - Sheep Eye
 - Sheep Heart
2. Formaldehyde-free specimens include:
 - Cat
 - Rat

P. REVIEW AND UPDATE

1. This Formaldehyde Safety Program will be reviewed and updated annually.