

# Formaldehyde Exposure Control Plan

**Procedure: 6. 09**  
**Version: 2.3**  
**Effective 01/31/2017**

## A. Purpose

To maintain formaldehyde exposure below the limits established by the Occupational Safety and Health Administration's (OSHA) Formaldehyde Standard 29 CFR 1910.1048. These limits are the Action Level (AL) of 0.5 ppm, Permissible Exposure Limit (PEL) of 0.75 ppm and/or Short-Term Exposure Limit (STEL) of 2.00 ppm.

It is Columbia University's (CU) policy to ensure hazards associated with formaldehyde use are anticipated, recognized, evaluated, controlled, and that information concerning these hazards is communicated to affected employees consistent with OSHA's Formaldehyde Standard.

## B. Applicability/Scope

University personnel who use or come in contact with formaldehyde and/or any compounds of formaldehyde, such as paraformaldehyde and formalin, under normal working conditions or during emergencies.

## C. Responsibilities

### 1. Laboratory Principal Investigator (PI)/ Supervisor

- a. Ensure employees working with formaldehyde are aware of all hazards associated with formaldehyde use by providing the appropriate Safety Data Sheets.
- b. Ensure employees are working with formaldehyde and/or any compounds of formaldehyde in accordance with the requirements of this policy.
- c. Provide employees with proper Personal Protective Equipment (PPE) and ensure they use PPE when handling and using formaldehyde, including a lab coat, closed toe shoes, long pants/skirts, protective eyewear, and appropriate gloves.
- d. Ensure employees are familiar with the formaldehyde specific spill kit located in the laboratory and are aware how to properly use it.
- e. Notify EH&S when there is potential for formaldehyde exposure.
- f. Inform employees about results of exposure monitoring, whether that be verbally, visually through a posting, or through email.
- g. Ensure employees receive medical consultation, at no cost to them, by Workforce Health & Safety when their exposure reaches or exceeds the AL, PEL and/or STEL or if symptoms are experienced.
- h. Provide employees with proper respiratory protection if recommended by EH&S after an exposure assessment determines that their exposure exceeds regulatory limits and engineering controls are not feasible.

### 2. Environmental Health and Safety

- a. Provide exposure monitoring when requested by the PI/Supervisor or as deemed necessary by EH&S through routine survey.
- b. Provide results of exposure monitoring to the Supervisor as required under the OSHA Formaldehyde Standard.
- c. Provide formaldehyde training to those with an exposure at or above 0.1ppm as required by the OSHA Formaldehyde Standard.
- d. Provide respirator fit testing for reusable respirators, if determined necessary through an exposure assessment.
- e. Maintains formaldehyde exposure monitoring and reusable respirator fit testing records.

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### 3. Healthcare Provider

- a. Provide medical surveillance in accordance with OSHA Formaldehyde Standard regulations when exposure is at or above regulatory limits during normal working conditions or in emergencies.
- b. Provide medical clearance when personnel are recommended to use respiratory protection.
- c. Provide respirator fit testing for N-95 respirators, if determined necessary through an exposure assessment.
- d. Maintain medical surveillance records, respirator medical clearance records, and N-95 respirator fit test records in accordance to the regulatory requirements.

### D. Definitions

1. *Formaldehyde* - The chemical substance, which has various hazards associated with it. For the purposes of this policy, formaldehyde includes all compounds of formaldehyde such as paraformaldehyde and formalin. The Chemical Abstracts Service (CAS) Registry No. is 50-00-0. This number can be used to find a Safety Data Sheet for formaldehyde.
2. *Authorized personnel* - Means any person required by work duties to be present in regulated areas, or authorized to do so by the employer.
3. *Normal work conditions* – Any activities that are completed during a typical work shift as listed in the employee’s job description.
4. *Emergency* - Is any occurrence, such as but not limited to equipment failure, rupture of containers, or failure to control equipment that results in an uncontrolled release of a significant amount of formaldehyde.
5. *Occupational Health and Safety Administration Formaldehyde Standard (OSHA Formaldehyde Standard)* – A standard established by the Federal regulatory agency to control occupational exposures to formaldehyde through the use of action levels, permissible exposure limits, short term exposure limits addressing airborne concentrations. The reference number for this standard is 29 CFR 1910.1048.
6. *Action Level (AL)* - Means a concentration of 0.5 parts formaldehyde per million parts of air (0.5 ppm) calculated as an eight (8)-hour time-weighted average (TWA) concentration, at which an assessment of exposure must begin.
7. *Permissible Exposure Limits (PEL)* - The time-weighted-average concentration for a conventional 8-hour workday (0.75 ppm) and a 40-hour workweek below which nearly all employees may be repeatedly exposed, day after day, without adverse effect.
8. *Short Term Exposure Limits (STEL)* - A 15-minute TWA exposure (2.0 ppm), which should not be exceeded at any time during a workday even if, the 8-hour exposure is within the OSHA-PEL as TWA.

### E. Procedure

1. If an employee’s exposure is at or above the AL, PEL, and/or STEL, the Principal Investigator/Supervisor shall take appropriate corrective action, including:
  - i. Suspend the use of formaldehyde in the affected area;
  - ii. Assess the work practices of the affected employee;
  - iii. Develop a written plan describing corrective actions being taken to reduce exposure below the AL, PEL, and/or STEL;
  - iv. Provide a copy of the plan to the affected employee;
  - v. Ask employee to complete medical surveillance questionnaire and seek medical evaluation at the Workforce Health and Safety (WHS) or a healthcare provider
  - vi. Consider product substitution.

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- a. Institute appropriate engineering controls available; Facilities Operations, in conjunction with EH&S, shall be requested to evaluate the feasibility of installing engineering controls if deemed necessary through an EH&S assessment.
- b. If corrective measures do not maintain exposure below the AL, PEL, and/or STEL, after consultation with EH&S, the affected employee shall be supplied with appropriate respiratory protection.

### 2. Exposure Monitoring

- a. Employees potentially exposed to formaldehyde shall be identified by various means (e.g. assessments and surveys), classified into exposure groups based on level of anticipated risk, and included in the sampling strategy.
- b. Monitoring shall be repeated upon notification by the Principal Investigator/Supervisor, each time there is a change in production, equipment, process, personnel, or control measures which may result in a new or additional exposure to formaldehyde.
- c. Monitoring shall be repeated at the request of an employee or when any employee reports signs or symptoms of respiratory or dermal conditions associated with formaldehyde exposure.
- d. Determination of an employee's exposure shall be made from breathing zone air samples that are representative of 8-hour and/or 15 minute monitoring.
- e. If, after implementing engineering controls, exposure is at or above the AL, PEL, and/or STEL, follow-up monitoring shall be conducted under worst-case exposure conditions:
  - i. every six months, if employee's previous exposure was at or above the AL;
  - ii. annually, if employee's previous exposure was at or above the STEL.
- f. It is prohibited to rotate employees for the purpose of limiting the exposure.
- g. Monitoring shall be terminated if results from two consecutive sampling periods taken at least 7 days apart show that employee exposure is below the AL, PEL, and the STEL unless periodic monitoring is specifically requested by the laboratory and EH&S.

### 3. Notification of Monitoring Results

- a. Within 15 days of receiving monitoring results, EH&S shall provide written notification to:
  - i. The Principal Investigator/Supervisor if results are below the AL/PEL/STEL.
  - ii. The affected employee and Principal Investigator/Supervisor, if the results are at or above the AL/PEL/STEL (Exposure Notification/Medical Surveillance).

### 4. Regulated Areas

- a. When repeated monitoring results shows the concentration of airborne formaldehyde is above the PEL and/or STEL, the Supervisor shall establish the area as a "regulated area" and post all entrances and accesses with observable signs containing these words:

**DANGER**  
**FORMALDEHYDE**  
**IRRITANT AND POTENTIAL CANCER HAZARD**  
**AUTHORIZED PERSONNEL ONLY**

- b. Access to regulated area shall be restricted to authorized personnel who have been trained to recognize the hazards of formaldehyde and to work safely using PPE.

### 5. Respiratory Protection

- a. Respirator use shall only be permitted when engineering controls cannot be implemented, the current controls are not able to reduce exposure below the AL/PEL/STEL, during the period of time before the installation of engineering controls, or during emergencies where exposure could exceed the AL/PEL/STEL.

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- b. Whenever respirator use is required, the employee shall be provided by their laboratory with an appropriate National Institute for Occupational Safety and Health (NIOSH) approved respirator at no cost, trained on proper use, and shall use it properly.
- c. EH&S will consult with the laboratory to select a respirator that reduces air-borne concentration of formaldehyde inhaled by the employee to at or below TWA or STEL.
- d. EH&S maintains a written respiratory protection program in accordance with the OSHA respiratory protection standard and provides training and fit testing for reusable respirator users.
- e. Employees must obtain medical clearance from the WHS or a healthcare provider before fit testing and respirator use.
- f. A powered air-purifying respirator shall be made available to any employee who experiences difficulty wearing a N-95 or reusable respirator.

### 6. Protective Equipment and Clothing

- a. Personal protective equipment (PPE) such as lab coats, gloves, goggles, face shields appropriate for use with formaldehyde, shall be provided at no cost to employees. The Supervisor shall ensure that employees:
  - i. Use appropriate PPE when working with formaldehyde.
  - ii. Avoid contact of the eyes and skin with liquids containing one (1%) percent or greater formaldehyde by the use of chemical protective clothing made of material impervious to formaldehyde.
  - iii. Use non-latex gloves, such as nitrile or butyl when handling formaldehyde.
  - iv. Do not reuse PPE and/or clothing that has become contaminated with formaldehyde before it is cleaned or laundered.
  - v. Store contaminated PPE and clothing in containers labeled as:
 

**DANGER**  
**FORMALDEHYDE -CONTAMINATED (CLOTHING) EQUIPMENT**  
**AVOID INHALATION AND SKIN CONTACT**
  - vi. Do not take home PPE or clothing contaminated with formaldehyde.
  - vii. Are trained properly before handling or removing formaldehyde contaminated clothing.
  - viii. Are provided a room to change contaminated clothing, if needed.
  - ix. Have access to working eyewash and emergency showers and are trained to use them in case of emergency.
  - x. Any person, who launders, cleans, or repairs formaldehyde contaminated clothing or equipment shall be informed of formaldehyde's potentially harmful effects and procedures to safely handle such material.

### 7. Housekeeping

- a. The workplace shall be maintained clean and free from formaldehyde contaminated debris.
- b. Formaldehyde contaminated debris and waste resulting from spills or other activities shall be placed for disposal in sealed container bearing label warning formaldehyde's presence and its hazards.
- c. Employees involved in clean up or maintenance should be informed about the hazards associated with formaldehyde exposure during such activities.

### 8. Hazard Communication

- a. All provisions of this program shall be enforced in all laboratories where formaldehyde is used.

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- b. Hazard warning labels that are in accordance with the Globally Harmonized System (GHS) and identify if the product contains formaldehyde shall be placed on the containers.
- c. Labels shall inform users of “Potential Cancer Hazard”.
- d. SDS shall be made accessible to employees, when requested, and should be reviewed and updated, periodically.

### 9. Information and Training

- a. Employees working with formaldehyde in a certified chemical fume hood or with less than 0.1 mL on a lab bench are not exposed to formaldehyde above 0.1ppm and, therefore, do not require training.
- b. Employees working with quantities of formaldehyde greater than 0.1 mL outside of a certified chemical fume hood are required to contact EH&S at [occusafety@columbia.edu](mailto:occusafety@columbia.edu) to discuss exposure prevention methods.
- c. If an employee’s exposure cannot be reduced to below 0.1ppm, training will be required annually and is provided by EH&S. This training will be in accordance with the OSHA Formaldehyde Standard, 29 CFR 1910.48.
- d. Training material is available from EH&S upon request and without cost to employees.

### 10. Review and Update

- a. The policy shall be reviewed periodically and updated as necessary.

## F. Emergency Contacts

1. The Principal Investigator/Supervisor should be the primary contact and he/she shall establish appropriate procedures and communicate to their employees, how to handle emergencies minimizing injury and loss of life.
2. The Principal Investigator/Supervisor shall make employees familiar with the spill kit, its location and proper use. (For major spills call EH&S or Public Safety on campus during evening hours, weekends and holidays).
3. Employees exposed to formaldehyde in an emergency where exposure could exceed the STEL, shall be referred to Workforce Health and Safety (WHS) at Columbia University Medical Center or another healthcare provider for medical consultation.

## G. Medical Surveillance and Examinations

1. Columbia University’s formaldehyde medical surveillance program is provided to affected employees by Workforce Health and Safety and is consistent with the OSHA Formaldehyde Standard.
2. Employees covered under the medical surveillance program shall be required to complete a medical surveillance questionnaire and annual medical evaluation, provided by Workforce Health and Safety.
3. When an employee is removed/transferred or restricted to work due to significant symptoms or medical condition from exposure, the Supervisor shall assure that the exposure to formaldehyde at the new location is not at/or above the AL, PEL, and/or STEL. Transfers will be consistent with Human Resources Policy and the OSHA Standard.
4. Any employee not working as a result of a medical condition due to formaldehyde exposure must arrange for a follow-up medical examination to take place within six months after termination of work, to determine if they can return to the original job status, or if the termination is to be permanent.
5. Employees exposed in an emergency shall be medically evaluated as soon as possible. If there is a life threatening condition as a result of exposure, they are to seek immediate attention in at an appropriate medical facility with follow-up the next business day in Workforce Health & Safety or another healthcare provider. A Columbia University Department Accident Report Form should accompany employee.

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### H. Recordkeeping

#### 1. Exposure Measurements

- a. EH&S maintains formaldehyde exposure monitoring records.
- b. Records shall include:
  - i. Date of measurement.
  - ii. Operation being monitored.
  - iii. Method of sampling and analysis
  - iv. Number, duration, time and results of samples taken.
  - v. Type of protective device worn.
  - vi. Names, job title, UNI numbers and exposure estimates.

#### 2. Medical Surveillance:

- a. The Workforce Health and Safety or another healthcare provider, when used, will maintain medical surveillance records as required under applicable regulations.

#### 3. Respirator Fit Testing:

- a. EH&S maintains records of training and fit testing for reusable respirators.
- b. Workforce Health and Safety maintains records of fit testing for N-95.
- c. The record shall include:
  - i. Employee name, job title and CUID number.
  - ii. A copy of the completed Respirator Medical Clearance Form.
  - iii. A copy of the completed Respirator Fit Test Record.
  - iv. The date of the most recent fit test.
  - v. Manufacturer, model, size & type of respirator provided to the employee.

#### 4. Training

- a. All training records shall be maintained by EH&S through the Rascal system.

#### 5. Retention of Records:

- a. The records shall be retained for at least the following periods:
  - i. Exposure records and determinations shall be kept for at least 30 years.
  - ii. Medical records shall be kept for the duration of employment plus 30 years
  - iii. Respirator fit testing records shall be kept until replaced by a more recent record.

#### 6. Availability of Records:

- a. Upon written request, exposure monitoring or medical records shall be made available for examination and or copying to the subject employee or former employee or their representative.

### I. Appendices N/A

### J. Forms N/A

### K. References

1. OSHA Standard 29 CFR 1910.1048. Occupational Exposure to Formaldehyde  
[http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10075](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10075)
2. Policy for Personal Protective Equipment in Research Laboratories  
<https://research.columbia.edu/system/files/EHS/Policies/PPE.pdf>