
WAKE FOREST
UNIVERSITY
HEALTH SCIENCES

FORMALDEHYDE CONTROL PLAN

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FORMALDEHYDE CONTROL PLAN
Wake Forest University Health Sciences

PREPARED BY:
Environmental Health and Safety

Effective: May 2003
Through: May 2005

POLICY

Faculty, students and staff working with formaldehyde are required to be informed of the chemical and physical hazards of formaldehyde and have their exposure to formaldehyde evaluated.

PURPOSE

This document provides the Wake Forest University Health Sciences (WFUHS) Formaldehyde Hazard Communication and Exposure Control Plan.

SCOPE

This document applies to all occupational exposures to formaldehyde, i.e. from formaldehyde gas, its solutions and materials that release formaldehyde.

AUTHORITY

OSHA 29 CFR 1910.1048 Formaldehyde

PROCEDURE**RESPONSIBILITIES**

1. FACULTY

- Purchase of formaldehyde and formaldehyde containing products through Peoplesoft Tools®.
- Participate in annual Formaldehyde Hazard Communication Training.
- Provide required Personal Protective Equipment (PPE) and Engineering Controls for use with formaldehyde.

2. STUDENTS

- Attend annual Formaldehyde Hazard Communication Training.
- Perform work with formaldehyde per Standard Operating Procedures.

3. STAFF

- Attend annual Formaldehyde Hazard Communication Training.
- Perform work with formaldehyde per Standard Operating Procedures.

4. WFUHS ENVIRONMENTAL HEALTH AND SAFETY (WFUHS EH&S)

- Maintain an active inventory of areas where formaldehyde is used or stored.
- Perform periodic exposure monitoring for formaldehyde.
- Maintain this program.
- Conduct an annual review of this program.

EXPOSURE MONITORING

1. GENERAL

- WFUHS EH&S will monitor faculty, students and staff to determine their exposure to formaldehyde.
- Where WFUHS EH&S documents that exposure to formaldehyde will be less than the action limit or short term exposure limit, WFUHS will not be required to measure employee exposure to formaldehyde.
- When an employee's exposure is determined from representative sampling, the measurements used will be representative of the employee's full shift or short-term exposure to formaldehyde, as appropriate.
- Representative samples for each job classification in each work area will be taken for each shift, unless WFUHS EH&S can document, with objective data, that exposure levels for a given job classification are equivalent for different work shifts.

2. EXPOSURE MONITORING DETERMINATION

- From the chemical purchases submitted by Principal Investigators, WFUHS EH&S will identify all faculty, students, and staff who may be exposed at or above the action level or at or above the Short Term Exposure Limit and accurately determine the exposure of each person so identified.
- EH&S will develop a representative sampling strategy and measure sufficient exposures within each job classification for each work shift to correctly characterize and not underestimate the exposure of any employee within each exposure group.
- The initial monitoring process 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.
 - If Employee Health receives reports of signs or symptoms of respiratory or dermal conditions associated with formaldehyde exposure, WFUHS will promptly arrange for EH&S to monitor the affected employee's exposure.

3. PERIODIC MONITORING

- WFUHS EH&S will periodically measure and accurately determine exposure to formaldehyde for faculty and staff shown by the initial monitoring to be exposed at or above the action level, or at or above the Short Term Exposure Limit.
- If the last monitoring results reveal employee exposure at or above the action level, WFUHS EH&S will repeat monitoring of the faculty and staff at least every 6 months.

- If the last monitoring results reveal employee exposure at or above the Short Term Exposure Limit, WFUHS EH&S will repeat monitoring of the faculty and staff at least once a year under worst conditions.

4. TERMINATION OF MONITORING

WFUHS EH&S may discontinue periodic monitoring for faculty and staff if results from two consecutive sampling periods taken at least 7 days apart show that employee exposure is below the action level and the Short Term Exposure Limit. The results must be statistically representative and consistent with WFUHS EH&S knowledge of the job and work operation.

5. ACCURACY OF MONITORING

The accuracy of monitoring shall be equivalent to that required by the OSHA standard.

EMPLOYEE NOTIFICATION OF MONITORING RESULTS

Employees shall be notified in accordance with WFUHS Chemical Exposure Monitoring Plan.

OBSERVATION OF MONITORING

Observation of monitoring will be in accordance with the Chemical Exposure Monitoring Plan.

REGULATED AREAS

- Regulated areas where the concentration of airborne formaldehyde exceeds either the Time Weighted Average (TWA) or the Short Term Exposure Limit (STEL) will be posted at all entrances and access ways with signs bearing the following information:

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

- WFUHS will limit access to regulated areas to authorized persons who have been trained to recognize the hazards of formaldehyde.

METHODS OF COMPLIANCE

1. ENGINEERING CONTROLS AND WORK PRACTICES

- WFUHS will institute engineering and work practice controls to reduce and maintain employee exposures to formaldehyde at or below the TWA and the Short Term Exposure Limit.
- Whenever WFUHS has established that feasible engineering and work practice controls cannot reduce employee exposure to or below either of the PELs, WFUHS will apply these controls to reduce employee exposures to the extent feasible and will supplement them with respirators, which satisfy this standard.

2. RESPIRATORY PROTECTION

- Where respiratory protection is required, WFUHS Principal Investigators or supervisors will provide the respirators at no cost to the employee and will assure that they are properly used. The respirators will comply with the requirements of this standard and will reduce the concentration of formaldehyde inhaled by the employee to at or below both the TWA and the Short Term Exposure Limit.
- Respirators will be used in the following circumstances:
 - During the interval necessary to install or implement feasible engineering and work practice controls.
 - In work operations, such as maintenance and repair activities or vessel cleaning, for which WFUHS establishes that engineering and work practice controls are not feasible.
 - In work situations where feasible engineering and work practice controls are not yet sufficient to reduce exposure to or below the PELs.
 - In emergencies:
- Respirators will be selected in accordance with Table 1 of OSHA Standard 29 CFR 1910.1048 and the [WFUHS Respiratory Protection Program](#). WFUHS will make available a powered air-purifying respirator adequate to protect against formaldehyde exposure to any employee who experiences difficulty wearing a negative pressure respirator to reduce exposure to formaldehyde.
- Respirator usage will be governed by the requirements of the [WFUHS Respiratory Protection Program](#)
- Fit tests will be conducted in accordance with Appendix H of the [WFUHS Respiratory Protection Program](#).
- Respirators selected will be from those exhibiting the best facepiece fit.
- No respirator will be chosen that would potentially permit the employee to inhale formaldehyde at concentrations in excess of either the TWA or the Short Term Exposure Limit.

PROTECTIVE EQUIPMENT AND CLOTHING

1. When protective equipment or clothing is provided under this program, WFUHS will provide these protective devices at no cost to the employee and assure that the employee use them.
2. A written Hazard Evaluation will be made using [PPE Hazard Assessment and Certification Form](#).
3. Selection criteria for PPE is as follows:
 - WFUHS will select protective clothing and equipment based upon the form of formaldehyde to be encountered, the conditions of use, and the hazard to be prevented.
 - All contact of the eyes and skin with liquids containing 1 percent or more formaldehyde will be prevented by the use of chemical protective clothing made of material impervious to formaldehyde and the use of other personal

protective equipment, such as goggles and face shields, as appropriate to the operation.

- Contact with irritating or sensitizing materials will be prevented to the extent necessary to eliminate the hazard.
 - Where a face shield is worn, chemical safety goggles are also required if there is a danger of formaldehyde reaching the area of the eye.
 - Full body protection will be worn for entry into areas where concentrations exceed 100 ppm and for emergency reentry into areas of unknown concentration.
4. WFUHS will assure that protective equipment and clothing that has become contaminated with formaldehyde is cleaned or laundered before its reuse.
 5. When ventilating formaldehyde-contaminated clothing and equipment, WFUHS will establish a storage area so that employee exposure is minimized. Containers for contaminated clothing and equipment and storage areas will have labels and signs containing the following information:

DANGER
FORMALDEHYDE-CONTAMINATED [CLOTHING] EQUIPMENT
AVOID INHALATION AND SKIN CONTACT

6. WFUHS will assure that only persons trained to recognize the hazards of formaldehyde remove the contaminated material from the storage area for purposes of cleaning, laundering, or disposal.
7. WFUHS will assure that no employee takes home equipment or clothing that is contaminated with formaldehyde.
8. WFUHS will repair or replace all required protective clothing and equipment for each affected employee as necessary to assure its effectiveness.
9. WFUHS will inform any person who launders, cleans, or repairs such clothing or equipment of formaldehyde's potentially harmful effects and of procedures to safely handle the clothing and equipment.

HYGIENE PROTECTION

1. WFUHS will provide change rooms, as described in OSHA Regulations covering Workplace Sanitation, for faculty and staff who are required to change from work clothing into protective clothing to prevent skin contact with formaldehyde.
2. If faculty and staff's skin become splashed with solutions containing 1 percent or greater formaldehyde, for example, because of equipment failure or improper work practices, WFUHS will provide conveniently located quick drench showers and assure that affected faculty and staff use these facilities immediately.
3. If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1 percent or greater formaldehyde, WFUHS will provide acceptable eyewash facilities within the immediate work area for emergency use.

4. For operations involving formaldehyde liquids or gas, WFUHS will conduct a program to detect leaks and spills, including regular visual inspections.
5. Preventative maintenance of equipment, including surveys for leaks, will be undertaken at regular intervals.
6. In work areas where spillage may occur, WFUHS will make provisions to contain the spill, to decontaminate the work area, and to dispose of the waste.
7. The WFUHS will assure that all leaks are repaired and spills are cleaned promptly by faculty and staff wearing suitable protective equipment and trained in proper methods for cleanup and decontamination.
8. Formaldehyde-contaminated waste and debris resulting from leaks or spills will be placed for disposal in sealed containers bearing a label warning of formaldehyde's presence and of the hazards associated with formaldehyde.

EMERGENCIES

Emergency procedures for formaldehyde spills are found in the Emergency Procedure for Spills of Aldehydes.

MEDICAL SURVEILLANCE

1. FACULTY AND STAFF COVERED
 - WFUHS will institute medical surveillance programs for all faculty and staff exposed to formaldehyde at concentrations at or exceeding the action level or exceeding the Short Term Exposure Limit.
 - WFUHS will make medical surveillance available for faculty and staff who develop signs and symptoms of overexposure to formaldehyde and for all faculty and staff exposed to formaldehyde in emergencies. When determining whether an employee may be experiencing signs and symptoms of possible overexposure to formaldehyde, WFUHS will rely on the evidence that signs and symptoms associated with formaldehyde exposure will occur only in exceptional circumstances when airborne exposure is less than 0.1 ppm and when formaldehyde is present in material in concentrations less than 0.1 percent.
2. STUDENTS COVERED

WFUHS will make medical surveillance available for students who develop signs and symptoms of overexposure to formaldehyde and for all employees exposed to formaldehyde in emergencies. When determining whether an employee may be experiencing signs and symptoms of possible overexposure to formaldehyde, WFUHS will rely on the evidence that signs and symptoms associated with formaldehyde exposure will occur only in exceptional circumstances when airborne exposure is less than 0.1 ppm and when formaldehyde is present in material in concentrations less than 0.1 percent.

HAZARD COMMUNICATION

1. GENERAL

- Communication of the hazards associated with formaldehyde in the workplace will be governed by the requirements of paragraph L.1.b. The definitions of the OSHA Hazard Communication Standard will apply.
- The following will be subject to the hazard communication requirements of this paragraph: formaldehyde gas, all mixtures or solutions composed of greater than 0.1 percent formaldehyde, and materials capable of releasing formaldehyde into the air, under reasonably foreseeable conditions of use, at concentrations reaching or exceeding 0.1 ppm.
- As a minimum, specific health hazards that WFUHS will address are: cancer, irritation and sensitization of the skin and respiratory system, eye and throat irritation, and acute toxicity.

2. LABELS

- WFUHS will assure that hazard-warning labels complying with the requirements of the OSHA Hazard Communication Standard are affixed to all containers of materials listed in paragraph L.1.b.

- INFORMATION ON LABELS

As a minimum, for all materials listed in paragraph L.1.b. capable of releasing formaldehyde at levels of 0.1 ppm to 0.5 ppm, labels will identify that the product contains formaldehyde; list the name and address of the responsible party; and state that physical and health hazard information is readily available from WFUHS and from material safety data sheets.

For materials listed in paragraph L.1.b. capable of releasing formaldehyde at levels above 0.5 ppm, labels will appropriately address all hazards, including respiratory sensitization, and will contain the words "Potential Cancer Hazard."

- In making the determinations of anticipated levels of formaldehyde release, WFUHS may rely on objective data indicating the extent of potential formaldehyde release under reasonably foreseeable conditions of use.
- Substitute warning labels. WFUHS may use warning labels required by other statutes, regulations, or ordinances, which impart the same information, as the warning statements required by this paragraph.

3. WRITTEN HAZARD COMMUNICATION PROGRAM

A written [Hazard Communication Plan](#) is available.

EMPLOYEE INFORMATION AND TRAINING

1. PARTICIPATION

- WFUHS will assure that all faculty; staff and students who are assigned to workplaces/ instructional areas where there is exposure to formaldehyde participate in a training program.
- WFUHS will provide such information and training to faculty, staff and students at the time of initial assignment, and whenever a new exposure to formaldehyde is introduced into the work/instructional area. The training will be repeated at least annually.

2. TRAINING PROGRAM

The training program will be conducted in a manner, which the employee is able to understand and will include:

- A discussion of the contents of the OSHA regulation and the contents of the Material Safety Data Sheet.
- The purpose for and a description of the medical surveillance program required by this standard, including:
 - A description of the potential health hazards associated with exposure to formaldehyde and a description of the signs and symptoms of exposure to formaldehyde.
 - Instructions to immediately report to WFUHS the development of any adverse signs or symptoms that the employee suspects is attributable to formaldehyde exposure.
- Description of operations in the work area where formaldehyde is present and an explanation of the safe work practices appropriate for limiting exposure to formaldehyde in each job;
- The purpose for, proper use of, and limitations of personal protective clothing and equipment;
- Instructions for the handling of spills, emergencies, and clean-up procedures;
- An explanation of the importance of engineering and work practice controls for employee protection and any necessary instruction in the use of these controls; and
- A review of emergency procedures including the specific duties or assignments of each employee in the event of an emergency.

3. ACCESS TO TRAINING MATERIALS

- WFUHS will inform all affected faculty and staff of the location of written training materials and will make these materials readily available, without cost, to the affected faculty and staff.
- WFUHS will provide, upon request, all training materials relating to the employee-training program to the Assistant Secretary and the Director.

RECORDKEEPING

1. EXPOSURE MEASUREMENTS

WFUHS will establish and maintain an accurate record of all measurements taken to monitor employee exposure to formaldehyde. This record will include:

- The date of measurement.
- The operation being monitored.

- The methods of sampling and analysis and evidence of their accuracy and precision.
- The number, durations, time, and results of samples taken.
- The types of protective devices worn.
- The names job classifications, social security numbers, and exposure estimates of the faculty and staff whose exposures are represented by the actual monitoring results.

2. EXPOSURE DETERMINATIONS

Where WFUHS has determined that no monitoring is required under this standard, WFUHS will maintain a record of the objective data relied upon to support the determination that no employee is exposed to formaldehyde at or above the action level.

3. MEDICAL SURVEILLANCE

WFUHS will establish and maintain an accurate record for each employee subject to medical surveillance under this standard. This record will include:

- The name and social security number of the employee.
- The physician's written opinion.
- A list of any employee health complaints that may be related to exposure to formaldehyde.
- A copy of the medical examination results, including medical disease questionnaires and results of any medical tests required by the standard or mandated by the examining physician.

4. RESPIRATOR FIT TESTING

Respiratory fit test records will be maintained in accordance with the [WFUHS Respiratory Protection Program](#).

5. RECORD RETENTION

WFUHS will retain records required by this standard for at least the following periods:

- Exposure records and determinations will be kept for at least 30 years.
- Medical records will be kept for the duration of employment plus 30 years.
- Respirator fit testing records will be kept until replaced by a more recent record.

6. AVAILABILITY OF RECORDS

- Upon request, WFUHS will make all records maintained as a requirement of this standard available for examination and copying to the Assistant Secretary of Labor and the Director of NIOSH.
- The WFUHS will make employee exposure records, including estimates made from representative monitoring and available upon request for

examination, and copying to the subject employee, or former employee, and employee representatives in accordance with the OSHA regulation covering Access to Employee Exposure and Medical Records.

- Employee medical records required by this standard will be provided upon request for examination and copying, to the subject employee or former employee or to anyone having the specific written consent of the subject employee or former employee in accordance with the OSHA regulation covering Access to Employee Exposure and Medical Records.

PROGRAM REVIEW

This program shall be reviewed in the fourth quarter of each year. Any action items will be reported to the Director of Environmental Health and Safety for resolution.

GLOSSARY

1. "Action level" means a concentration of 0.5 part formaldehyde per million parts of air (0.5 ppm) calculated as an eight (8)-hour time-weighted average (TWA) concentration.
2. "Assistant Secretary" means the Assistant Secretary of Labor for the Occupational Safety and Health Administration, U.S. Department of Labor, or designee.
3. "Authorized Person" means any person required by work duties to be present in regulated areas, or authorized to do so by WFUHS, by this section, or by the OSH Act of 1970.
4. "Director" means the Director of the National Institute for Occupational Safety and Health, U.S. Department of Health and Human Services, or designee.
5. "Emergency" is any occurrence; such as but not limited to equipment failure, rupture of containers, or failure of control equipment that results in an uncontrolled release of a significant amount of formaldehyde.
6. "Employee exposure" means the exposure to airborne formaldehyde, which would occur without corrections for protection provided by any respirator that is in use.
7. "Formaldehyde" means the chemical substance, HCHO, Chemical Abstracts Service Registry No. 50-00-0.