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FORMALDEHYDE EXPOSURE CONTROL PLAN

Pages: 11

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

1. INTRODUCTION

This safety policy implements the Department of Labor, Occupational Safety and Health Administration (OSHA) Standard Title 29, Code of Federal Regulations (CFR), Part 1910.1048, *Formaldehyde*. The OSHA Standard and this policy comprise a unit, which prescribes the minimum requirements for a formaldehyde exposure control plan.

It is the policy of Georgetown University Medical Center (GUMC) to provide employees with a safe and healthful working environment. This plan is designed to inform employees of potential hazards associated with workplace exposures to formaldehyde, as mandated by 29 CFR 1910.1048. Workplace formaldehyde exposures shall be maintained at or below the permissible exposure level (PEL) of 0.75 parts per million (ppm) and the short term exposure limit (STEL) of 2.0 ppm per 15 minutes of exposure.

This safety policy applies to all GUMC employees. It does not apply to GUMC-owned, contractor-operated operations as they are responsible for developing their own formaldehyde exposure control plans.

2. DEFINITIONS

For purposes of this policy, the following definitions shall apply.

Action level - 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.

Emergency - 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.

Employee exposure - The exposure to airborne formaldehyde which would occur without corrections for protection provided by any respirator that is in use.

Formaldehyde - The chemical substance, HCHO, Chemical Abstracts Service (CAS) Registry No. 50-00-0.

Permissible Exposure Limit (PEL) - A chemical exposure limit that is published and

enforced by OSHA as a legal limit. The PEL is usually referred to as a concentration averaged over an 8-hour work shift, and termed the PEL-time weighted average (TWA).

Short Term Exposure Limit (STEL) - The maximum concentration to which workers can be exposed for a short period of time (usually 15 minutes). Workers may only be exposed to the STEL four times throughout the day with at least one hour between exposures.

3. RESPONSIBILITIES

3.1. Office of Regulatory Affairs:

- 3.1.1. Establish a policy that ensures compliance with OSHA Title 29 CFR 1910.1048.
- 3.1.2. Ensure adequate resource allocations to support formaldehyde exposure control plan requirements.

3.2. Office of Environmental Health and Safety:

- 3.2.1. Establish and maintain a formaldehyde exposure control plan consistent with federal regulations (29 CFR 1910.1048) and the GUMC goal of protecting employees from hazardous exposures.
- 3.2.2. Evaluate operations using formaldehyde and coordinate with the Department of Safety and Environmental Management to determine the degree of hazard posed by the potential exposure, determine whether engineering or administrative controls are feasible, and defining regulated areas.
- 3.2.3. For employees requiring respiratory protection for formaldehyde use, fit test employees in accordance to 29 CFR 1910.134.
- 3.2.4. Educate and train employees assigned to workplaces where there is exposure to formaldehyde. Special exceptions may be granted if exposure monitoring demonstrated that employees are not exposed to formaldehyde at or above 0.1 ppm.
- 3.2.5. Maintain records of all training, exposure monitoring, and respirator fit testing
- 3.2.6. Ensure continued compliance through monitoring and audit programs.
- 3.2.7. Conduct a formaldehyde exposure control plan review at least annually or whenever necessary to reflect new or modified tasks and procedures which affect exposures.

3.3. Occupational Health:

- 3.3.1. Conduct medical surveillance for all employees exposed to formaldehyde at concentrations at or exceeding the action level or exceeding the STEL.

- 3.3.2. Conduct the necessary physical examinations to any employee who may be at increased risk from exposure to formaldehyde and at the time of initial assignment and at least annually thereafter to all employees required to wear a respirator to reduce exposure to formaldehyde.
- 3.3.3. Formally notify the employee, his/her supervisor, and the Office of Environmental Health and Safety if a medical restriction is applied.
- 3.3.4. Maintain medical records relating to consultations, examinations and medical surveillance as required by this Plan.

3.4. Department/ Supervisors:

- 3.4.1. Identify employees working with formaldehyde and request formaldehyde exposure assessments. Refer these employees to the Office of Environmental Health and Safety for exposure assessment and training.
- 3.4.2. Allocate funds for personal protective equipment (PPE) at no cost to the employee and medical surveillance of employees. Ensure the availability of appropriate PPE, provide adequate storage facilities, and encourage proper PPE use.
- 3.4.3. Ensure employees have received the necessary training before engaging in workplace operations using formaldehyde.
- 3.4.4. Maintain this policy in the workplace and enforce its requirements.

3.5. Employees/ Respirator Wearer:

- 3.5.1. Follow the safety provisions outlined in this policy.
- 3.5.2. Attend mandated safety training conducted by the Office of Environmental Health and Safety.
- 3.5.3. Use the provided engineering controls, administrative practices, and PPE according to the instructions and training received.
- 3.5.4. Notify supervisors of unusual conditions or changes in work practices.
- 3.5.5. Notify supervisors if signs and symptoms of overexposure to formaldehyde are experienced.

4. PROCEDURES

4.1. Background

4.1.1. **Health Effects** – Formaldehyde is irritating to tissues when it comes into direct contact with them. Some people are more sensitive to the effects of formaldehyde than others. The most common symptoms include irritation of the eyes, nose, and throat, along with increased tearing, which occurs at air concentrations of about 0.4–3 parts per million (ppm). National Institute for Occupational Safety and Health (NIOSH) states that formaldehyde is immediately dangerous to life and health at 20 ppm. Formaldehyde may be irritating to the eyes, skin, and mucous membranes. Ingestion may cause corrosive injury to the gastrointestinal mucosa, with nausea, vomiting, pain, hematemesis, and perforation. Systemic effects include CNS depression, seizures, coma, jaundice, albuminuria, hematuria, anuria, and metabolic acidosis. Acute health effects include burning in the eyes, nose, throat; skin rashes, nausea, coughing and chest tightness. Sensitive individuals may have reactions at concentrations as low as 0.1 ppm. Respiratory tract irritation, rhinitis, anosmia, cough, dyspnea, wheezing, tracheitis, bronchitis, laryngospasm, pulmonary edema, headache, weakness, dizziness, and palpitations may result from inhalation. Dermatitis, brownish discoloration of the skin, urticaria, and pustulovesicular eruptions, may develop from dermal exposure. Concentrated solutions can cause coagulation necrosis. Irritation, lacrimation, and conjunctivitis may develop with exposure to vapors. Eye exposure to solutions with high formaldehyde concentrations may produce severe corneal opacification and loss of vision. Solutions containing low formaldehyde concentrations may produce transient discomfort and irritation. Formaldehyde has not been shown definitely to be teratogenic in animals. Formaldehyde probably presents little or no risk as a potential human teratogen. Formaldehyde appears to be mutagenic. The basis for its genetic activity is its ability to form cross-links in DNA and proteins. Immunogenic responses include dermatitis and asthma. Acute overexposure can lead to pneumonitis and death. NIOSH and the American Conference of Government Industrial Hygienists (ACGIH) categorize formaldehyde as a potential human carcinogen. The International Agency for Cancer Research (IARC) classifies formaldehyde as carcinogenic to humans.

4.1.2. **Controlling Exposures** - Occupational exposure should be reduced through safe work practices, proper ventilation, industrial hygiene evaluation, periodic air sampling, and the use of personal protective equipment (PPE).

4.2. Determination of Employee Exposure

4.2.1. **Exposure Evaluation** – The Office of Environmental Health and Safety will evaluate all operations having the potential to expose employees to any levels of formaldehyde. If exposures above the OSHA Action Level (AL) or Short-Term Exposure Limit (STEL) are anticipated, the Office of Environmental Health and Safety will formally request an investigation by the University Industrial Hygienist in the Department of Safety and Environmental Management (SEM). SEM shall perform air monitoring and evaluate the work practices, PPE, and engineering

controls used for each task. SEM shall provide the employee with a written copy of the sampling results and assessment finding within 15 working days after the receipt of the results of any monitoring performed.

- 4.2.2. **Overexposure** – When reports of signs and symptoms of respiratory or dermal conditions associated with formaldehyde exposure occur, the affected employee shall be promptly evaluated by Occupational Health.
- 4.2.3. **Monitoring Frequency** – Monitoring will be conducted as follows:
- 4.2.3.1. If the last monitoring results reveal employee exposure at or above the action level, employee exposure monitoring will be repeated at least every 6 months.
- 4.2.3.2. If the last monitoring results reveal employee exposure at or above the STEL, employee exposure monitoring will be repeated at least once a year under worst case conditions.
- 4.2.3.3. Monitoring will be conducted as stated above until results are achieved that are below the AL or STEL for two consecutive sampling periods. When exposures in an area are determined to be below the PEL or STEL, that area will be evaluated on a regular schedule, as determined by the University industrial hygienist and work area supervisor.
- 4.2.4. **Reporting Results** - Employee monitoring results shall be reviewed within 15 days of receiving the results, and posted or distributed for employee review. When the exposure is over the AL of 0.5 ppm, a written plan from Environmental Health and Safety to reduce employee exposure will be given to each employee. The plan will describe the corrective actions being taken to decrease the exposure.
- 4.2.5. **Regulated Areas** - When the concentration of airborne formaldehyde in an area exceeds the PEL or STEL, all entrances shall have signs bearing the following information:

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

Access to these regulated areas will be limited to authorized persons who have been trained to recognize the hazards of formaldehyde.

4.3. Labels

4.3.1. **Requirement** - Hazard warning labels complying with the requirements of the Hazard Communication Standard (29 CFR 1910.1200) shall be affixed to all containers of materials.

4.3.2. **Information on labels**

4.3.2.1. 0.1 PPM to 0.5 PPM - As a minimum, labels on all materials capable of releasing formaldehyde at levels of 0.1 ppm to 0.5 ppm, shall 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 both the employer and from Material Safety Data Sheets.

4.3.2.2. Above 0.5 PPM - Materials capable of releasing formaldehyde at levels above 0.5 ppm, shall have labels appropriately addressing all hazards as defined in this document (including respiratory sensitization), and shall contain the words "Potential Cancer Hazard."

4.3.2.3. Determining Potential Release - Objective data indicating the extent of potential formaldehyde release under reasonably foreseeable conditions can be used in making the determination of potential release.

4.4.Engineering Controls and Work Practices

4.4.1. **Engineering Controls** - Engineering controls (including local exhaust ventilation) will be used to control exposure when feasible.

4.4.2. **Personal Protective Equipment and Clothing**

4.4.2.1. Description - Personal protective equipment and clothing shall be provided at no cost to the employee and includes (as needed):

4.4.2.1.1. Clothing (cover gown or apron) made of material impervious to formaldehyde.

4.4.2.1.2. Face shields and/or safety goggles.

4.4.2.1.3. Gloves.

4.4.2.1.4. Respiratory protection as needed.

4.4.2.2. **Respirator Use** - It is not anticipated that respirators will be used to maintain exposure levels below the PEL, STEL or Action Level. However, if they are needed the following requirements will apply:

4.4.2.2.1. Negative pressure respirators will be issued.

4.4.2.2.2. All employees shall have qualitative or quantitative face fit-tests at the time of initial fitting and annually thereafter. EH&S must be contacted for fit-testing.

- 4.4.2.2.3. Respirators are provided at no cost to the employee. Funding will be provided by each department.
- 4.4.2.2.4. Where air-purifying chemical cartridge respirators are used to reduce exposure to below a PEL or STEL, the cartridges shall be replaced after three 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.
- 4.4.2.2.5. Employees may leave the work area to wash their faces and respirator facepieces as needed to prevent skin irritation from respirator use.
- 4.4.2.2.6. The OSHA Respiratory Protection Standard (29 CFR 1910.134) shall be followed.
- 4.4.3. **Contaminated Materials** - Only persons trained by the work area supervisor to recognize the hazards of formaldehyde can remove contaminated material from storage areas for purposes of cleaning, laundering, or disposal. No employee may take home equipment or clothing that may be contaminated with formaldehyde.
- 4.4.4. **Equipment Inspection** - All required protective clothing and equipment shall be repaired or replaced as necessary to assure its effectiveness.
- 4.4.5. **Laundering** - Georgetown University shall 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.
- 4.4.6. **Hygiene Protection**
 - 4.4.6.1. **Emergency Showers** - If there is the potential for an employee's skin to be splashed with solutions containing one percent or greater of formaldehyde, conveniently located quick drench showers shall be provided.
 - 4.4.6.2. **Eyewashes** - If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1 percent or greater formaldehyde, eyewash facilities shall be provided within the immediate work area for emergency use.
- 4.4.7. **Housekeeping**
 - 4.4.7.1. **Inspections** - Visual inspections shall be conducted periodically by the work area supervisor to identify potential sources of exposure to formaldehyde, and if discovered, reported to EH&S.
 - 4.4.7.2. **Small Spills (<100 ml)** - Cleanup of small spills shall include the wearing of formaldehyde resistant personal protective equipment (e.g.: gown, gloves, shoe covers, goggles, etc.). Spill kits or adsorbent may be used. Contact the Department of Safety and Environmental Management (SEM) to request a pickup of the waste resulting from the spill.

4.4.7.3. Major Spills (>100 ml) - Evacuate the area. Restrict access. Notify the Department of Public Safety (7-HELP) for chemical spill response.

4.4.8. Medical Surveillance

4.4.8.1. Employees covered

4.4.8.1.1. Program – Occupational Health shall institute medical surveillance programs for all employees exposed to formaldehyde concentrations at or exceeding the action level (0.5 ppm/ 8hr-TWA) or exceeding the 15 minute STEL (2 ppm).

4.4.8.1.2. Availability - Medical surveillance shall be made available for employees who develop signs and symptoms of overexposure to formaldehyde and for all employees exposed to formaldehyde during emergencies. When determining whether an employee may be experiencing signs and symptoms of possible overexposure to formaldehyde, the employer may rely on the following:

“...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.”

4.4.8.2. **Requirements** - Medical surveillance of employees is available through Occupational Health. All medical procedures, including the administration of the medical disease questionnaire, shall be performed according to the provisions of 29 CFR 1910.1048. Medical surveillance will be performed without cost or loss of pay to the employee and at a reasonable time.

4.5. TRAINING

4.5.1. **Participation** - All employees who are assigned to workplaces where there is exposure to formaldehyde at or above 0.1 ppm shall participate in a training program.

4.5.2. **Requirements** - The work area supervisor or a designated person shall provide training to employees at the time of initial assignment, whenever a new exposure to formaldehyde is introduced into the work area and annually thereafter. The training program shall include at least the following:

4.5.2.1. A discussion of the contents of this regulation and the contents of the applicable Material Safety Data Sheet (MSDS).

4.5.2.2. The purpose for and a description of the medical surveillance program required by this standard, including:

- 4.5.2.2.1. A description of the potential health hazards associated with exposure to formaldehyde and a description of the signs and symptoms of exposure to formaldehyde. As a minimum, specific health hazards that the employer shall address are as follows: Cancer, irritation and sensitization of the skin and respiratory system, eye and throat irritation, and acute toxicity.
- 4.5.2.2.2. Instructions to immediately report to the work area supervisor and to Occupational Health upon the development of any adverse signs or symptoms that the employee suspects are attributable to formaldehyde exposure.
- 4.5.2.3. A 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.
- 4.5.2.4. The purpose for, proper use of, and limitations of personal protective clothing and equipment.
- 4.5.2.5. Instructions for handling spills, emergencies, and clean-up procedures.
- 4.5.2.6. An explanation of the importance of engineering and work practice controls for employee protection and instructions in the use of these controls.
- 4.5.2.7. A review of emergency procedures including the specific duties or assignments of each employee in the event of an emergency.

4.6. RECORD KEEPING

- 4.6.1. Exposure Monitoring -SEM will ensure environmental monitoring records are kept for 30 years and include:
 - 4.6.1.1. The date of measurement.
 - 4.6.1.2. The operation being monitored.
 - 4.6.1.3. The methods of sampling and analysis and evidence of their accuracy and precision.
 - 4.6.1.4. The number, durations, time, and results of samples taken.
 - 4.6.1.5. The types of protective devices worn.
 - 4.6.1.6. The names, job classifications, social security numbers, and exposure estimates of the employees whose exposures are represented by the actual monitoring results.
- 4.6.2. Medical Records – Occupational Health will maintain medical records for the length of employment plus 30 years.

4.6.3. Respiratory Protection - Environmental Health and Safety will maintain respiratory fit records for the length of employment plus 30 years and will include:

4.6.3.1. A copy of the protocol selected for respirator fit-testing.

4.6.3.2. A copy of fit-testing results.

4.6.3.3. The date of the most recent fit-testing, the name and social security number of each tested employee, and the respirator type and facepiece selected.

5. Program Review

This Policy/ Program is reviewed periodically by Environmental Health and Safety. Revision of this plan will occur whenever necessary to reflect new or modified safety practices, regulatory requirements or occupational exposures.

Approved by:

_____	_____	_____	_____
Susan Martin, Director	Date	Executive Vice President,	Date
Environmental Health & Safety		Health Sciences	
_____	_____		
Kenneth L. Dretchen, Director	Date		
Office of Regulatory Affairs			

APPENDIX A

**OSHA STANDARD 29 CFR 1910.1048
FORMALDEHYDE**