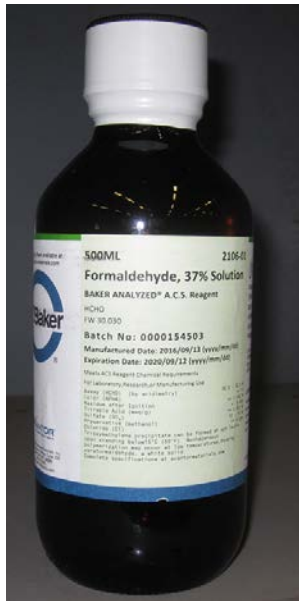


FORMALDEHYDE SAFETY AND COMPLIANCE PROGRAM

March 2020



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INTRODUCTION

The purpose of this program is to comply with Michigan Occupational Health and Safety Administration (MIOSHA) STD-1218 Part 306. Formaldehyde. Environmental Health and Safety (EHS) will be responsible for the development and administration of the Formaldehyde Safety and Compliance Program.

This policy has been developed to promote safe work practices for all employees who receive, prepare, handle or dispose of formaldehyde or clean up spills of formaldehyde. It is important to minimize occupational exposure to formaldehyde because of the risk of adverse health effects.

EXPOSURE LIMITS

Regulatory exposure limits are set by MIOSHA. Time weighted averages (TWA) are based on concentrations averaged over an 8-hour working period. Short-Term Exposure Limits (STEL) are 15-minute average exposure limits that should not be exceeded at any time during the workday.

Table 1. MIOSHA/ACGIH Exposure Limits for Formaldehyde

MIOSHA Exposure Limits	Concentration (PPM)
MIOSHA Action Level	0.5
MIOSHA Permissible Exposure Limit (PEL) TWA	0.75
MIOSHA STEL	2.0

EXPOSURE MONITORING

At Michigan State University EHS will perform monitoring to determine employee exposure to formaldehyde. Monitoring will be performed either with a diffusive sampler or a cartridge containing silica gel coated with 2,4-dinitrophenylhydrazine attached to an active sampling pump.

Representative monitoring will be determined for each job classification, in each work area, for each shift, and full shift or short term as deemed appropriate.

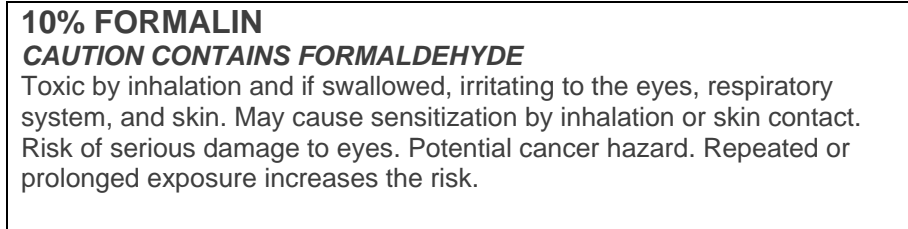
If an employee demonstrates signs of respiratory or skin conditions that are associated with formaldehyde exposure, EHS will monitor to determine the employee's exposure.

If EHS determines that the presence of formaldehyde or formaldehyde releasing products in the workplace could not possibly expose an employee at or above the action level or STEL under foreseeable conditions of use, exposure monitoring will not be required.

HAZARD COMMUNICATIONS

Safety Data Sheets (SDS) must be easily accessible in the work area for review. The College or Department will be responsible for Safety Data Sheets. Mixtures and solutions that contain more than 0.1% formaldehyde or are capable of releasing formaldehyde at concentrations of 0.1 ppm or higher, must have a label indicating that formaldehyde is present. Solutions with more than 0.5% formaldehyde, or solutions that are capable of releasing concentrations of 0.5 ppm or higher, must have warning labels stating that the material is a respiratory sensitizer and a "potential cancer hazard." EHS can be contacted for information on where to obtain appropriate labels.

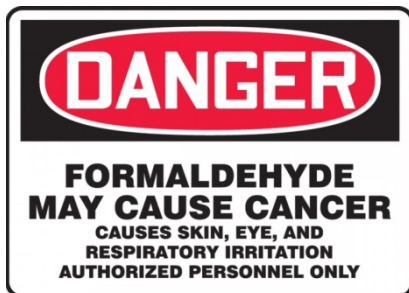
Figure 1. Example of a 10% Formalin Label



REGULATED AREAS

Regulated areas will be established where airborne formaldehyde concentrations exceed the PEL or the STEL at any time. Areas will be posted, and access will be restricted to authorized individuals. Posted area signs must contain the following information:

Figure 2. Formaldehyde Regulated Area Sign



MEDICAL SURVEILLANCE

Medical surveillance will be provided to employees who are exposed to concentrations exceeding the MIOSHA action level or STEL. Medical surveillance will be performed by MSU Occupational Health. Monitoring will be at no cost to the employee.

ENGINEERING CONTROLS

Local exhaust ventilation is one of the most efficient engineering controls for formaldehyde. In laboratories, work with formaldehyde should be conducted inside an EHS approved chemical fume hood. When fume hoods are not present, other options shall be sought such as downdraft tables, snorkel hoods, or slot hoods. Canopy hoods are not recommended as gas is drawn through the worker's breathing zone. General (Dilution) Ventilation should be not relied upon to control contaminant

concentrations. Dilute solutions containing less than 3.7% formaldehyde may be used on benchtops in small quantities only.

WORK PRACTICES

Work practices are essential in controlling formaldehyde exposures. Individual work practices are to be used in conjunction with engineering controls. Below are work practices to follow in order to minimize formaldehyde exposure.

- Stand as far away from sources of formaldehyde such as tissues and solutions as possible. The closer the employee is to the source, the higher the concentration will be.
- During anatomy labs, share the dissection load in order to minimize exposure time.
- Keep solution containers closed when not in use.
- Do not block ventilation supplies or exhausts.
- Use formaldehyde substitute when available (alcohol preserved tissue).
- Utilize an effective neutralizing agent when possible (Monoethanolamine).

PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE is the last line of defense against an exposure. PPE must be worn at all times and should be used in conjunction with engineering and work practice controls. PPE assessments for specific tasks have been conducted and are located in Appendix A. General Laboratory PPE is specified below and situations in which it is required.

- Safety glasses are required when >1% formaldehyde solutions are used and there is a low probability of splash. Safety glasses should be upgraded to goggles as appropriate to the operation.
- Goggles and face shield are required when a reasonable probability for splash exists, during spill cleanup, or when dispensing formalin (37% formaldehyde).
- Lab Coat/Sleeve Protector must be used if there is chance liquid containing formaldehyde may come in contact with the forearm (splash). Formaldehyde is a dermal sensitizing agent. If there is a probability that the lab coat may become saturated with liquid, a sleeve protector must be used.
- Gloves must be used and be disposable for incidental contact. Thick nitrile gloves should be used for dispensing formaldehyde and cleaning up spills.
- Respirator use requires a medical evaluation and a fit test. Full face piece air-purifying respirators can be used up to 7.5 ppm. Concentrations above 7.5 ppm require a self-contained breathing apparatus (SCBA).

EMERGENCY WASH FACILITIES

If there is any possibility that an employee's eyes may be splashed with solutions containing 0.1% or more formaldehyde, an eyewash within the immediate work area is required for emergency use.

If there is any possibility that an employee's skin may come in contact with solutions containing 1% or more formaldehyde, a quick drench shower within the immediate work area is required for emergency use.

EMERGENCY PROCEDURES

Formaldehyde spills are divided into three categories: small spills, liter size spills, and greater than a liter size spills. Each has their own designated response for each formalin concentration.

Table 2. Formaldehyde Spill Scenario Responses

Type of Spill	100% Formalin	10% Diluted Formalin
Small Spill (100 mL or less)	Unless trained, evacuate area and call EHS	Wipe up with an absorbent, dispose of in sealed container and place in fume hood
Medium Spill (100 mL to Liter)	Unless trained, evacuate area and call EHS	Unless trained, evacuate area and call EHS
Large Spill (Greater than 1 Liter)	Call 911	Unless trained, evacuate area and call EHS

TRAINING AND INFORMATION

All Michigan State University Employees working with chemicals must receive training in Hazard Communication or Chemical Hygiene & Hazardous Waste. In addition, areas where employee exposures may exceed 0.1 ppm formaldehyde, employees must also receive initial training on formaldehyde safety and refresher training annually after. Annual training will be provided electronically by EHS.

RECORDKEEPING

EHS will retain all exposure records and determinations for at least 30 years. EHS will retain current respirator fit testing records. MSU Occupational Health will keep medical records for the duration a worker's employment plus 30 years.

APPENDIX A. PERSONAL PROTECTIVE EQUIPMENT (PPE) ASSESSMENT

Task ¹	Safety Glasses ²	Splash Goggles and Face Shield	Full Face Respirator	Nitrile Gloves	Thick Nitrile Glove	Lab Coat ³
						
Human and Veterinary Anatomy Student Dissection	X			X		X
Prosection	X			X		X
Embalming	X			X		X
Dispensing Formalin		X		X		X
Large Formalin Spill			X		X	X
Small Formalin Spill		X		X		X
Tissue Trimming	X			X		X

¹If task is not listed, contact EHS in order to conduct PPE Assessment

²Upgrade to splash goggles as appropriate to operation

³If saturation is possible, sleeve protectors must be used in combination with lab coat

APPENDIX B. EXPOSURE MONITORING LOCATIONS

Locations listed below are known formaldehyde exposure monitoring locations.

MSU Veterinary Anatomy

Comparative Veterinary Gross Anatomy classes take place in Veterinary Medical Center G205.

Exposure Monitoring Frequency: 2 Times per year on employees and students; Once during Comparative Veterinary Gross Anatomy I in the fall and once during Comparative Veterinary Gross Anatomy II in the spring.

Engineering Controls: Approximately 19 air changes per hour (ACH) in anatomy lab.

MSU Fee Hall Anatomy

MSU Human Anatomy embalming, prosection and anatomy class take place in Fee Hall.

Exposure Monitoring Frequency: 1 time per year on embalming and prosection employees.

Engineering Controls: Prosection and classroom ventilation approximately 15 ACH; Embalming room ventilation approximately 30 ACH.

Grand Rapids Secchia Center Anatomy

MSU Human Anatomy embalming, prosection and anatomy class take place in the Grand Rapids Secchia Center.

Exposure Monitoring Frequency: 1 time per year on embalming and prosection employees.

Engineering Controls: General Exhaust Ventilation (GEV) system is equipped with Aircurity contaminant sensing.

Detroit Medical Center Anatomy

MSU Human Anatomy prosection and class takes place at the Detroit Medical Center.

Exposure Monitoring Frequency: Every two years on prosection employees.

Engineering Controls: GEV for prosection and classroom.

Macomb University Center Anatomy

MSU Human Anatomy prosection and class takes place at the Macomb University the Center.

Exposure Monitoring Frequency: Every two years on prosection employees.

Engineering Controls: GEV for prosection and classroom.

VDL (Veterinary Diagnostic Laboratory) Histopathology

Tissue trimming operations take place in the VDL Histopathology Lab.

Exposure Monitoring Frequency: Every two years on tissue trimming employees.

Engineering Controls: Employees perform tissue trimming operations in local exhaust hoods that are verified annually by EHS.