

## METHYLENE CHLORIDE EXPOSURE CONTROL PLAN FOR RESEARCH LABORATORIES

|                                                      |  |
|------------------------------------------------------|--|
| Laboratory-designated<br>Chemical Hygiene Officer:   |  |
| Laboratory Chemical<br>Hygiene Officer Contact Info: |  |

The University of Kentucky is committed to providing a safe and healthful work environment for our entire staff. In pursuit of this endeavor, the following exposure control plan (ECP) is provided to eliminate or minimize occupational exposure to methylene chloride (dichloromethane, DCM, CH<sub>2</sub>Cl<sub>2</sub>) in accordance with OSHA standard 29 CFR 1910.1052 "Methylene chloride" and the EPA's ruling for "Methylene Chloride; Regulation Under the Toxic Substances Control Act (TSCA)" published in the Federal Register on May 8, 2024, that became effective on July 8, 2024.

The ECP is a key document to assist our institution in implementing and ensuring compliance with the standard, thereby protecting our personnel. This ECP includes:

- Implementation of various methods of exposure control, including:
  - Elimination of DCM use
  - Substitution with less hazardous alternatives
  - Engineering controls
  - Administrative controls
  - Personal protective equipment (PPE)
- Communication of hazards to employees and training
- Determination of employee exposure
- Recordkeeping

The methods of implementation of these plan elements are discussed in the subsequent following ECP.

### PURPOSE, SCOPE AND APPLICABILITY

The purpose of this ECP is to document the actions taken to mitigate exposure to methylene chloride. This includes controlling methylene chloride exposure to a concentration that is below the EPA Existing Chemical Exposure Limit (ECEL) of 2 parts per million (ppm) as an eight-hour time-weighted average (8-hr. TWA) and below the EPA Short Term Exposure Limit (EPA STEL) of 16 ppm averaged over 15-minutes.

This ECP covers all laboratories and work areas where methylene chloride is handled and is applicable to all employees, students and visitors with the potential to be exposed (i.e., potentially exposed persons) to methylene chloride.

### PROGRAM ADMINISTRATION

- The laboratory Principal Investigator or designated Laboratory Supervisor, henceforth identified as the Chemical Hygiene Officer, is (are) responsible for the implementation of the ECP.

## METHYLENE CHLORIDE EXPOSURE CONTROL PLAN FOR RESEARCH LABORATORIES

- The laboratory's designated Chemical Hygiene Officer will maintain, review, and update the ECP at least annually, and whenever necessary to address changes such as new or modified tasks and procedures.
- Personnel who are determined to have potential exposure to methylene chloride (i.e., potentially exposed persons) must comply with the procedures and work practices outlined in this ECP.
- The laboratory Chemical Hygiene Officer will maintain and provide all necessary personal protective equipment (PPE), engineering controls (e.g., chemical fume hoods, local exhaust ventilation, etc.), and chemical waste labels as required by the standard. The laboratory Chemical Hygiene Officer will ensure that adequate supplies of the equipment are available in the appropriate sizes.
- The laboratory Chemical Hygiene Officer will be responsible for training, documentation of training, and making the written ECP available to employees and inspecting regulatory agencies.

### EMPLOYEE EXPOSURE DETERMINATION

The following is a list of job classifications in which employees in our laboratory may have the potential for exposure to methylene chloride. Included is a list of tasks and procedures, or groups of closely related tasks and procedures, in which exposure may occur for these individuals:

| Job Title           | Location      | Task or Procedure                                                            | Exposure Assessment for Procedure documented Y/N |
|---------------------|---------------|------------------------------------------------------------------------------|--------------------------------------------------|
| Example: Technician | 123 Chem-Phys | Decanting from primary drum into secondary container for use in experiments. | Y                                                |
|                     |               |                                                                              |                                                  |
|                     |               |                                                                              |                                                  |
|                     |               |                                                                              |                                                  |
|                     |               |                                                                              |                                                  |
|                     |               |                                                                              |                                                  |

### METHODS OF CONTROL

The hierarchy of controls will be utilized to identify possible controls to limit the potential exposure to methylene chloride at concentrations believed by the US EPA to present an unacceptable risk of injury to health. This includes the following:

- **Elimination:** Laboratories will eliminate the use of methylene chloride whenever it is feasible to do so.
- **Substitution:** Laboratories will substitute the use of less hazardous alternatives to methylene chloride whenever feasible to do so. Laboratories will periodically (e.g., annually) evaluate opportunities to substitute less hazardous alternatives through a literature review, discussion with appropriate subject matter experts, or means.
- **Engineering Controls:** Laboratories and other work areas (e.g., laboratory waste handling locations) will use engineering controls such as local exhaust ventilation or containment to control exposures to methylene chloride.
- **Administrative Controls:** Personnel will be trained in appropriate work practices and use of equipment, including PPE, to ensure the safe handling of methylene chloride.
- **Personal Protective Equipment (PPE):** Personnel shall wear all appropriate PPE consistent with hazard assessment for the procedures performed.

### ENGINEERING CONTROLS

Methylene chloride handling activities within the laboratory shall only be performed within a chemical fume hood or by utilizing other approved engineering controls.

Methylene chloride handling activities performed in other locations (e.g., transfer of agent, disposal procedures) shall be performed according to the laboratory's documented standard operating procedures to maintain personnel exposure below the established limits.

**The following engineering controls are not permissible:**

**Dilution Ventilation:** Dilution ventilation does not provide adequately control methylene chloride exposures below the ECEL and EPA STEL.

To ensure that engineering controls perform adequately to control methylene chloride exposures the following will occur:

**Installation:** Upon installation or following significant repair or renovation laboratory fume hoods will be commissioned in accordance with the test methods prescribed by ANSI/ASHRAE Standard 110: Methods of Testing Performance of Laboratory Fume Hoods. Test records will be maintained by the EHS Occupational Health and Safety Department. Other local exhaust ventilation (e.g., slotted hoods, grossing stations, etc.) will be commissioned in a manner that confirms performance in a manner consistent with manufacturer specifications.

## METHYLENE CHLORIDE EXPOSURE CONTROL PLAN FOR RESEARCH LABORATORIES

**Regular Fume Hood Inspections:** Laboratory fume hoods performance will be evaluated at least annually in accordance with ASHRAE 110. Other local exhaust ventilation (e.g., slotted hoods, grossing stations, etc.) will be commissioned in a manner that confirms performance in a manner consistent with manufacturer specifications.

**Personnel will be trained to properly utilize laboratory fume hoods and local exhaust ventilation at the time they are assigned to use this equipment.**

Proper use of laboratory fume hoods includes:

- Maintaining the fume hood sash below the indicated height of operation and as low as practical.
- Working at least 6 inches from the front of the hood.
- Positioning equipment within the hood in a manner that will not prevent the hood from adequately capturing contaminants.
- Upon hearing a fume hood alarm, immediately secure materials and stop working within the hood until the issue has been corrected.
- Contact the EHS Occupational Health and Safety Department for fume hood repairs, to address operation issues, or to verify proper operation of the laboratory fume hood.

### ADMINISTRATIVE CONTROLS

The following administrative controls are not permissible: **Personnel rotation** is not a permissible practice for maintaining exposures below the ECEL and STEL. This practice is prohibited by regulation.

### PERSONAL PROTECTIVE EQUIPMENT (PPE)

- PPE is provided to employees at no cost to them. Training is provided by the designated laboratory Chemical Hygiene Officer in the use of the appropriate PPE for the tasks or procedures employees will perform.
- Personnel will use PPE to provide protection from dermal contact.
- Polyvinyl alcohol, laminate, or Viton gloves will be used when handling methylene chloride.
- Lab coats will be worn when handling methylene chloride in a laboratory setting.
- Supplied air respiratory protection will be used in regulated areas where individuals may be exposed to methylene chloride concentrations that exceed the ECEL or EPA STEL. Respirators will be used in accordance with the institutional Respiratory Protection Plan.

**The types of PPE available to employees are as follows:**

**PPE is located at and may be obtained through:**

All employees using PPE must observe the following precautions:

- Wash hands immediately or as soon as feasible after removal of gloves or other PPE.
  - Remove PPE after it becomes contaminated, and before leaving the work area.
  - **Used PPE may be disposed of in (list appropriate containers for storage, laundering, decontamination, or disposal):**
- 
- Wear appropriate gloves when handling or touching contaminated items or surfaces; replace gloves if torn, punctured, contaminated, or if their ability to function as a barrier is compromised. Reusable chemical protective gloves may be decontaminated for reuse if their integrity is not compromised; discard reusable chemical protective gloves if they show signs of cracking, peeling, tearing, puncturing, or deterioration.
  - Never wash or decontaminate disposable gloves for reuse.
  - Wear appropriate face and eye protection when splashes, sprays, spatters, or droplets of hazardous chemicals pose a hazard to the eye, nose, or mouth.
  - Remove immediately or as soon as feasible any garment contaminated by hazardous chemicals in such a way as to avoid contact with the outer surface.
  - Grossly contaminated PPE or solid waste involved in spill cleanup of methylene chloride must be disposed of in a closed container or tightly sealed bag and disposed of as hazardous waste.
  - Contaminated laundry will be handled as little as possible, with minimal agitation. Wet, contaminated laundry will be placed in leak-proof containers before transport.

**The procedure for handling used PPE is as follows:**

(Example: Chemical protective face shields and eye protection are soaked and cleaned with soapy water, rinsed in the sink, and placed on a drying rack until reuse).

**Lab coats or other reusable PPE garments will be laundered by:**

## METHYLENE CHLORIDE EXPOSURE CONTROL PLAN FOR RESEARCH LABORATORIES

**The following PPE will be worn when handling and/or sorting contaminated laundry:**

### HOUSEKEEPING

Accumulated hazardous chemical waste is placed in containers which are closable, constructed to contain all contents and prevent leakage, appropriately labeled, and closed prior to removal to prevent spillage or protrusion of contents during handling.

Bins and pails (e.g., wash or emesis basins) are cleaned and decontaminated as soon as feasible after visible contamination.

Broken glassware which may be contaminated is picked up using mechanical means, such as a brush and dustpan.

### LABELING

The following labeling method(s) are used in University of Kentucky research laboratories:

Primary manufacturer's stock container and secondary chemical containers shall be marked with the received, opened, and expiration date.

Primary hazards must be indicated with verbiage or usage of the Globally Harmonized System pictograms for Irritant and Health Hazard (see below for pictograms).



Methylene chloride chemical waste will be disposed of according to EHS Environmental Quality Management Department guidance, and using labeling provided by this department for use in waste ticketing and pickup.

Signage for the designated working area for procedures with methylene chloride must be posted. This signage is attached to this Exposure Control Plan

### EMPLOYEE TRAINING

**Personnel covered by the methylene chloride standard receive an explanation of this ECP during their initial training session with the laboratory designated Chemical Hygiene Officer.** It will also be reviewed in their annual refresher training. All employees have an opportunity to review this plan at any time during their work shifts by contacting the laboratory Chemical Hygiene Officer.

## METHYLENE CHLORIDE EXPOSURE CONTROL PLAN FOR RESEARCH LABORATORIES

All employees who have occupational exposure to methylene chloride receive training on the hazards, handling, labeling, use, first aid, disposal. In addition, the training program covers, at a minimum, the following elements:

- a copy and explanation of the standard
- an explanation of our ECP and how to obtain a copy
- an explanation of methods to recognize tasks and other activities that may involve exposure to methylene chloride, including what constitutes an exposure incident
- an explanation of the use and limitations of engineering controls, work practices, and PPE
- an explanation of the types, uses, location, removal, handling, decontamination, and disposal of PPE
- an explanation of the basis for PPE selection
- information on the appropriate actions to take and persons to contact in an emergency involving methylene chloride
- an explanation of the procedure to follow if an exposure incident occurs, including
- the method of reporting the incident and the medical follow-up that will be made available
- information on the post-exposure evaluation and follow-up that the employer is required to provide for the employee following an exposure incident
- an explanation of the signs and labels required by the standard and used at this facility
- an opportunity for interactive questions and answers with the person conducting the training session.
- Training materials for the laboratory and documentation of employee completion and understanding shall be maintained in the laboratory specific Chemical Hygiene Plan.

An online training module covering a subset of the above listed content has been made available in the SciShield system to assist researchers continuing work with this chemical.

### REGULATED AREAS

Regulated areas are known areas of work with methylene chloride where exposure to airborne concentrations of methylene chloride exceeds or can be expected to exceed either the PEL or the STEL.

Regulated areas will be demarcated with sign that states, “WARNING: Regulated Area. Methylene chloride, authorized personnel only. Respiratory protection and protective clothing required.” Access to regulated areas will be restricted only to individuals that have been trained and authorized to enter. Training content will include the information identified in the Training section of this document as well as instructions on the proper use, maintenance and limitations of PPE. Individuals entering regulated areas will participate in

## METHYLENE CHLORIDE EXPOSURE CONTROL PLAN FOR RESEARCH LABORATORIES

a medical surveillance program, coordinated by the EHS Occupational Health and Safety Department.

### POST-EXPOSURE EVALUATION AND FOLLOW-UP

All workplace incidents, and workplace acquired injuries or illnesses sustained by UK personnel shall be reported to Workers Care by calling (800)440-6285 by:

**(Principal Investigator or Laboratory Supervisor)**

UK students may contact University Health Services (859) 323-APPT during business hours, or (859) 323-5321 after business hours, on weekends or holidays.

Following the initial first aid (clean the wound, flush eyes or other mucous membrane, etc.), the following activities will be performed:

- Document the routes of exposure and how the exposure occurred.
- Identify and document the source individual (unless the employer can establish that identification is infeasible or prohibited by state or local law).
- Assure that the exposed employee is provided with any information about applicable disclosure laws and regulations concerning the identity and health status of the source individual (e.g., laws protecting confidentiality).

Unsafe working conditions or “near-miss” incidents (incidents not resulting in injury or release of hazardous material) is encouraged to be reported to UK Occupational Health and Safety at:

<https://ehs.uky.edu/apps/incident>

Lab personnel shall be trained on and informed of the following emergency procedures as well as the procedures detailed in their Building Emergency Action Plan (BEAP)

Fire, rupture of containers resulting in large spills, failure of engineering controls or safety equipment, and/or any other circumstance resulting in uncontrolled release of hazardous materials:

- Alert personnel in the immediate vicinity. Give instructions to sound the alarm and call for assistance.
- Only where safe and possible: turn off any heat sources, confine the fire or emergency, shut the chemical fume hood sash and close any doors. These measures can help to prevent the spread of vapors, gases, or fire.
- Evacuate the building or hazardous area. Use the evacuation alarm system. Follow posted evacuation procedures. Assemble at your lab’s designated meeting point. Practice evacuation and assembly in drills.
- Summon aid from a safe location and call 911. Give location and explain the emergency.

## ADMINISTRATION OF POST-EXPOSURE EVALUATION AND FOLLOW-UP

### (Principal Investigator or Laboratory Supervisor)

ensures that the health care professional evaluating an employee after an exposure incident receives the following:

- a description of the employee's job duties relevant to the exposure incident
- route(s) of exposure
- circumstances of exposure
- if applicable, results of the source individual's blood test
- relevant employee medical records

(Name of responsible person or department) provides the employee with a copy of the evaluating health care professional's written opinion within 15 days after completion of the evaluation.

## PROCEDURES FOR EVALUATING THE CIRCUMSTANCES SURROUNDING AN EXPOSURE INCIDENT

An UK Injury and Illness Prevention Specialist will review the circumstances of all exposure incidents to determine:

- engineering controls in use at the time
- work practices followed
- a description of the device being used (including type and brand)
- protective equipment or clothing that was used at the time of the exposure incident
- location of the incident
- procedure being performed when the incident occurred
- employee's training

The UK Occupational Health and Safety Department will record all percutaneous injuries from contaminated sharps in the Injury Log.

If it is determined that revisions need to be made,

### (Principal Investigator or Laboratory Supervisor)

will ensure that appropriate changes are made to this ECP. (Changes may include an evaluation of safer devices, adding employees to the exposure determination list, etc.)

## RECORDKEEPING

Training records are completed for each employee upon completion of training. These documents will be kept for at least three years in the laboratory's specific Chemical Hygiene Plan

## METHYLENE CHLORIDE EXPOSURE CONTROL PLAN FOR RESEARCH LABORATORIES

The training records include:

- the dates of the training sessions
- the contents or a summary of the training sessions
- the names and qualifications of persons conducting the training
- the names and job titles of all persons attending the training sessions

Medical records are maintained for each employee with occupational exposure in accordance with 29 CFR 1910.1020, "Access to Employee Exposure and Medical Records." (University Health Services and My Chart) is responsible for maintenance of the required medical records. These confidential records are kept for at least the duration of employment plus 30 years. Employee medical records are provided upon request of the employee or to anyone having written consent of the employee within 15 working days.

### **OSHA Recordkeeping**

An exposure incident is evaluated to determine if the case meets OSHA's Recordkeeping Requirements (29 CFR 1904). This determination and the recording activities are done by the UK EHS Injury and Illness Prevention Specialist.

In addition to the 1904 Recordkeeping Requirements, all percutaneous injuries from contaminated sharps are also recorded in the Sharps Injury Log.

All incidences must include at least:

- the date of the injury
- the type and brand of the device involved
- the department or work area where the incident occurred
- an explanation of how the incident occurred.

This log is reviewed at least annually as part of the annual evaluation of the program and is maintained for at least five years following the end of the calendar year that they cover. If a copy is requested by anyone, it must have any personal identifiers removed from the report.

*Template approved by the University of Kentucky Chemical Safety Committee on February 18, 2025*