

# UConn

WORKPLACE  
CHEMICAL  
PROTECTION  
PROGRAM:  
METHYLENE  
CHLORIDE

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## Workplace Chemical Protection Program: Methylene Chloride

### I. INTRODUCTION

On July 8, 2024, the Environmental Protection Agency (EPA) issued a final rule to regulate methylene chloride under the Toxic Substances Control Act (TSCA) due to its unreasonable risk of injury to health. The rule prohibits the manufacture (including import), processing, and distribution in commerce of methylene chloride for all consumer use (after May 5, 2025) and most industrial and commercial uses (after April 28, 2026), except for 13 conditions including industrial and commercial use as a laboratory chemical.

The rule requires the development of a Workplace Chemical Protection Program (WCPP) to ensure lab personnel using methylene chloride take measures to meet new inhalation exposure limits and develop and implement an exposure control plan. This WCPP provides information on regulatory exposure limits, initial and periodic monitoring, respirator selection criteria, recordkeeping, and downstream notification for methylene chloride to ensure lab personnel are protected and comply with the EPA requirements of [40 CFR Part 751](#) under the Toxic Substances Control Act.

### II. APPLICABILITY

The WCPP applies to all employees, students, visitors, and other potentially exposed persons working in UConn laboratories with methylene chloride or mixtures of methylene chloride at a concentration of 0.1% or greater, including the deuterated form (CAS # 1665-00-5).

### III. DESCRIPTION



Methylene chloride (CAS # 75-09-2) is a clear, colorless liquid with a sweet, chloroform-like odor. It is volatile, slightly soluble in water, and miscible with most organic solvents. It is also referred to as dichloromethane (DCM), methylene dichloride, or methylene bichloride. This WCPP applies to all forms of methylene chloride at greater than 0.1%, including the deuterated form (CAS # 1665-00-5).

Methylene chloride is commonly used as a solvent, reagent, analytical standard, or other experimental substance in laboratories for chemical analysis, chemical synthesis, instrument calibration, dissolving other substances, extracting and purifying other chemicals, and other uses in research and development.

Inhaling the vapor may cause mental confusion, light-headedness, nausea, vomiting, and headache. Continued exposure may cause increased staggering, unconsciousness, and even death. High vapor concentrations may cause irritation of the eyes and respiratory tract. Long term exposure has been linked to cancer.

**IV. HAZARDS**

The following acute and chronic hazards are associated with exposure to methylene chloride:

Type of Effect	OSHA Pictogram	Description
Acute (Short Term)		<ul style="list-style-type: none"> <li>Eye and Skin Irritant</li> <li>Drowsiness or dizziness (Central Nervous System)</li> </ul>
Chronic (Long Term)		<ul style="list-style-type: none"> <li>Suspected Carcinogen</li> <li>Damage to organs (Liver, Kidneys, Blood)</li> </ul>

**V. OCCUPATIONAL EXPOSURE LIMITS**

Lab personnel must comply with the EPA chemical exposure limits in the table below while working in laboratories or other work areas with methylene chloride:

Exposure Limit Name	EPA Exposure Limit
Action Level (8-hour Time Weighted Average (TWA))	1 ppm (4 mg/m <sup>3</sup> )
Existing Chemical Exposure Limit (ECEL) (8-hour Time Weighted Average (TWA))	2 ppm (8 mg/m <sup>3</sup> )
Short Term Exposure Limit (STEL) – 15 minute	16 ppm (57 mg/m <sup>3</sup> )

**VI. INITIAL AND PERIODIC EXPOSURE MONITORING**

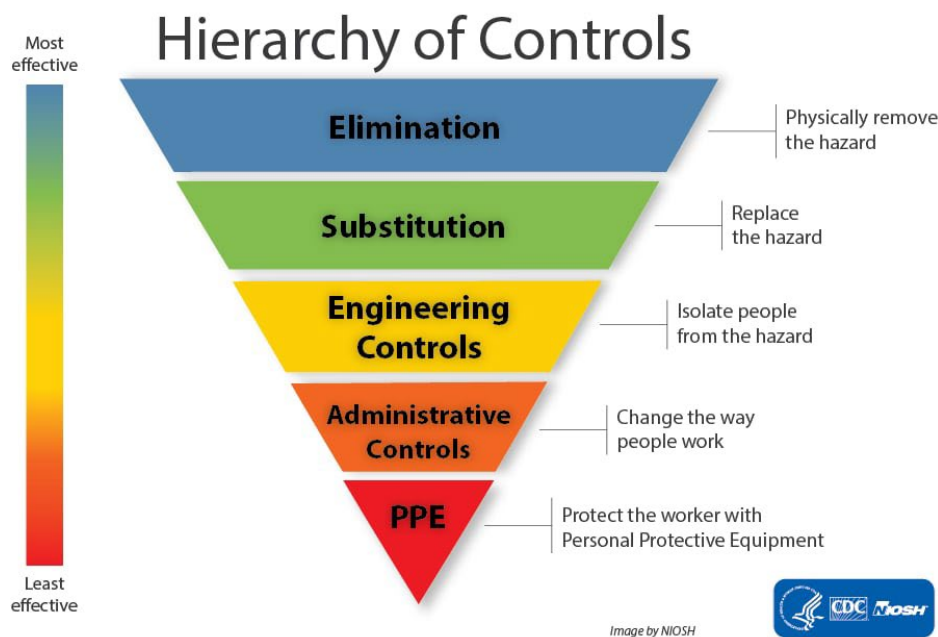
The EPA requires exposure monitoring to ensure all individuals working with methylene chloride are not being exposed at or above the EPA exposure limits. Prior to beginning operations involving methylene chloride or modifying existing operations in any manner that may increase exposure, lab personnel must notify EHS to perform an exposure assessment. The results of the exposure monitoring will dictate how often monitoring needs to recur based on the table below:

Air Concentration Requirement	Periodic Monitoring Requirement
The initial exposure monitoring concentration is below the ECEL action level and at or below the EPA STEL.	ECEL and EPA STEL periodic monitoring at least once every 5 years.
The initial exposure monitoring concentration is below the ECEL action level and above the EPA STEL.	ECEL periodic monitoring at least once every 5 years AND EPA STEL periodic monitoring is required every 3 months.
The initial exposure monitoring concentration is at or above the ECEL action level and at or below the ECEL; and at or below the EPA STEL.	ECEL monitoring every 6 months
The initial exposure monitoring concentration is at or above the ECEL action level and at or below the ECEL; and above the EPA STEL.	ECEL periodic monitoring every 6 months AND EPA STEL periodic monitoring every 3 months.
The initial exposure monitoring concentration is above the ECEL and below, at, or above the EPA STEL.	ECEL periodic monitoring every 3 months AND EPA STEL periodic monitoring every 3 months.

Exposure monitoring must be conducted for all potentially exposed persons or for an individual or group of individuals determined to be representative of the exposure group. EHS can help determine how many representative samples are appropriate with lab personnel based on the number of lab personnel and types of experiments and operations involving methylene chloride.

**VII. EXPOSURE CONTROL PLAN**

The principal investigator, laboratory manager, or other qualified representative of the laboratory who oversees or conducts operations involving methylene chloride must complete an Exposure Control Plan (ECP). The exposure control plan must document the actions taken to mitigate employee exposures and comply with the WCPP. The exposure control plan must describe efforts that will be taken to protect potentially exposed persons through use of the hierarchy of controls using elimination, substitution, engineering controls, administrative controls, and work practices to limit methylene chloride exposure to the greatest extent possible prior to requiring personal protective equipment (PPE). A picture of the Hierarchy of Controls is listed below:



If the principal investigator or laboratory manager identifies that exposure control measures will not be used (e.g., using a fume hood to minimize exposure to methylene chloride) in the ECP, they must identify why measures are not feasible, not effective, or otherwise not being implemented. The principal investigator or laboratory manager must also describe the regulated area, the persons authorized to enter the regulated area(s), the operations and procedures

taking place in the regulated area, and how the plan will be updated as new research with methylene chloride is introduced.

EHS will maintain training records and ensure that chemical fume hoods are tested annually to ensure proper function. Principal investigators and laboratory managers must ensure that the engineering controls, administrative controls, or work practices in their exposure control plan are being implemented by lab personnel and that the ECP is updated every 5 years or whenever operations, exposure control devices, personnel, or work practices change that could result in increased exposure to methylene chloride.

## **VIII. ENGINEERING CONTROLS**

Engineering controls seek to control hazards at their source by designing the work environment or the job itself to eliminate or reduce exposure to hazards. The following engineering controls should be used to minimize exposure to methylene chloride:

- All research with methylene chloride must be conducted in a chemical fume hood, with the sash at the lowest working height and with sliding sash panels (if applicable) aligned to form a barrier between the researcher and the experiment.
- Chemical fume hoods must be running between 80-120 linear feet/minute and tested by EHS within the last year. If the hood is not working properly, contact [Facilities](#) to repair the hood or [EHS](#) to retest the hood.
- PIs and laboratory managers must determine if glove boxes, or other types of local exhaust ventilation can be used as a substitute for chemical fume hoods. Use of methylene chloride outside of chemical fume hoods must be reported to EHS for evaluation prior to research.

## **IX. ADMINISTRATIVE CONTROLS**

Administrative controls are policies, work practices, and procedures designed to limit personnel exposure to workplace hazards. Administrative controls are often used in conjunction with engineering controls and personal protective equipment.

- Lab-specific safety training must be provided by the principal investigator (PI) or other qualified personnel to all researchers working with methylene chloride.

- Read the safety data sheet (SDS) for methylene chloride prior to use.
- Whenever possible, find safer substitutes or reduce the quantity of methylene chloride being used.
- Establish a Regulated Area where airborne concentrations of methylene chloride exceed, or there is a reasonable possibility they may exceed, the applicable ECEL or the EPA STEL.
- In most labs, the regulated area should be a fume hood, glove box, or other exposure control device.
- The Regulated Area must be clearly marked with a sign that identifies the chemical hazard and includes an appropriate warning (i.e., DANGER - METHYLENE CHLORIDE - AUTHORIZED PERSONNEL ONLY) and be placed in a conspicuous area.
- Restrict access in the Regulated Area to lab personnel who lack proper training, personal protective equipment, or who are otherwise unauthorized to enter.
- Regulated areas must be established within 3 months following receipt of initial monitoring data or by August 1, 2025.
- Label all secondary containers of methylene chloride with the chemical name and hazard classes.
- Keep original containers and secondary containers tightly sealed when not in use.
- Purchase smaller volumes of stock containers.
- Keep methylene chloride away from strong oxidizers, strong acids, metals, amines, and other incompatible chemicals.
- Keep methylene chloride in well-ventilated areas away from ignition sources.
- Transport methylene chloride in secondary containment, preferably in a polyethylene or another compatible container.
- Keep storage areas and work areas with methylene chloride clean, orderly and in a sanitary condition.
- Wash hands thoroughly with soap and water before and after handling methylene chloride and prior to exiting the lab.

## **X. PERSONAL PROTECTIVE EQUIPMENT**

When engineering or administrative controls are not feasible or do not provide sufficient protection from hazards, principal investigators and/or laboratory managers are responsible for providing appropriate personal protective equipment (PPE) to lab personnel and ensuring its proper maintenance and use.

- At a minimum, chemical splash goggles or safety glasses that meet American National Standards Institute (ANSI) standard Z-87.1 must be worn when handling methylene chloride. PIs must determine when or if full-face shields are required.
- A lab coat should be worn when working with methylene chloride. Lab coats must be buttoned and fit properly to cover as much skin as possible.
- Long pants or other clothing that covers the legs must be worn. Shorts, skirts or other clothing that expose the skin of the legs is not allowed.
- Closed-toed footwear, which covers the entire foot, must be worn when working with methylene chloride.

#### **A. Dermal Protection**

Principal investigators and laboratory managers must provide chemical-resistant gloves and training on proper glove use to lab personnel using methylene chloride. The specific type of glove(s) must be indicated in the ECP. Supervisory personnel should account for glove selection (type, material), expected duration of glove effectiveness, actions to take when glove integrity is compromised, storage requirements, and procedures for glove removal and waste disposal.

Methylene chloride penetrates through standard nitrile, latex, neoprene, polyethylene, and butyl rubber gloves. Principal investigators and laboratory managers may prefer to have their lab personnel wear two pairs of gloves. The inner glove should be made of a laminate of polyethylene (PE)/ethylene vinyl alcohol (EVOH), polyethylene vinyl alcohol and ethylene vinyl alcohol (PVA/EVA), polyvinyl alcohol (PVA), or another laminate glove resistant to methylene chloride. Disposable gloves (e.g., nitrile, neoprene, etc.) may be used over the laminate gloves to protect the inner gloves and provide dexterity but must be changed frequently or whenever contamination occurs. Safety data sheets and manufacturer's glove guides can be used to determine the best option for the labs.

#### **B. Respiratory Protection**

Principal investigators and laboratory managers must ensure engineering controls, work practices, and administrative controls maintain their effectiveness to reduce employee exposure at or below the existing chemical exposure limit (ECEL). If respiratory protection is required, supplied-air respirators must be used by all in the lab affected by the exposure, regardless of whether individuals are directly working with methylene chloride.



This EPA rule does not allow the use of air-purifying respirators due to the short service life of chemical cartridges when used with methylene chloride.

If labs or work areas fail to adequately control methylene chloride at or below the existing chemical exposure limit, supplied-air respirators must be used. Supplied air respirators must be NIOSH approved and supply a source of Grade D air (at a minimum) via a cylinder or compressor. This will require annual medical evaluations, training, and fit testing for everyone who is required to wear respirators. Labs will need to pay for the respirators, annual medical evaluations, fit testing and contract with an external vendor to ensure the proper annual training, work practices, inspection, maintenance, and decontamination practices are followed to comply with [OSHA 1910.134](#).

#### **XI. NOTIFICATION AND RECORDKEEPING**

Potentially exposed persons will be notified of monitoring results within 15 business days after receiving the monitoring results. EHS and the principal investigator/laboratory manager shall maintain monitoring records for a minimum of 5 years and must be readily available upon request for inspection.

#### **XII. WASTE DISPOSAL**

All methylene chloride waste must be labeled with “Hazardous Waste” stickers or tags, use full chemical names to describe the waste (i.e., no chemical abbreviations or symbols), be stored in sturdy, plastic containers with tight-fitting caps or lids, and be stored alone or with other compatible chemicals. Hazardous wastes must be stored at or near a green “Satellite Accumulation Area” sign prior to pick-up and disposal by [EHS](#).

#### **XIII. EMERGENCY PROCEDURE**

If a spill or another emergency occurs involving methylene chloride, lab personnel must follow the procedure below:

Emergency Procedure	
1.	<b>RELOCATE</b> everyone in the immediate work area to a safe location.
2.	<b>ALERT</b> - Dial 911. Follow the directions of the dispatcher. The person that dials 911 must meet UCFD upon arrival to provide further information about the emergency.
3.	<b>CONFINE</b> - If it can be done safely, close doors to confine the area where the emergency occurred and post an " <u>Emergency Hangtag</u> " on the door(s) to prevent reentry by other personnel.
4.	<b>EVACUATE</b> the building through the nearest exit. Do not run. Do not use elevators.
5.	<b>REPORT</b> to your designated meeting site.
6.	<b>REENTER</b> once emergency personnel have cleared the area.

**XIV. FIRST AID PROCEDURES**

If an exposure to methylene chloride occurs, lab personnel must follow the procedure below:

First Aid Procedures	
<b>First Aid- Eyes</b>	<ol style="list-style-type: none"> <li>1. Move to the eyewash, forcibly hold eyelids open and begin flushing both eyes with water.</li> <li>2. Remove contact lenses and eyewear while flushing (if applicable).</li> <li>3. Dial 911 or have someone else dial 911.</li> <li>4. Keep flushing eyes under the eyewash until emergency personnel arrive.</li> <li>5. Report incident to investigator/lab manager and EHS.</li> </ol>
<b>First Aid- Ingestion</b>	<ol style="list-style-type: none"> <li>1. Immediately rinse the mouth with water and then drink water (two glasses at most). <b>Do NOT induce vomiting.</b></li> <li>2. Have another person from the lab dial <b>911</b>.</li> <li>3. Report incident to investigator/lab manager and EHS.</li> </ol>

<p><b>First Aid- Inhalation</b></p>	<ol style="list-style-type: none"> <li>1. Move to fresh air.</li> <li>2. Dial 911 or have someone else dial 911.</li> <li>3. Report incident to investigator/lab manager and EHS.</li> </ol>
<p><b>First Aid- Skin</b></p>	<ol style="list-style-type: none"> <li>1. Move to safety shower, pull shower handle, and flush affected area with water.</li> <li>2. Remove contaminated clothing while flushing (if applicable). Do not pull clothes overhead.</li> <li>3. Dial 911 or have someone else dial 911.</li> <li>4. Keep rinsing affected area until emergency personnel arrive.</li> <li>5. Report incident to investigator/lab manager and EHS.</li> </ol>

**XV. REFERENCES**

- Environmental Protection Agency. [Final Risk Management Rule for Methylene Chloride.](#)
- Environmental Protection Agency. [A Guide To Complying with the 2024 Methylene Chloride Regulation under the Toxic Substances Control Act \(TSCA\)](#)
- Environmental Protection Agency. [Risk Management for Methylene Chloride.](#)
- Environmental Protection Agency. [FACT SHEET 2024 Final Risk Management Rule for Methylene Chloride under TSCA.](#)
- National Institute for Occupational Safety and Health (NIOSH). [Hierarchy of Controls.](#)
- Occupational Safety and Health Administration. [Methylene Chloride.](#)