Dichloromethane (DCM) Workplace Chemical Protection Program (WCPP)

Contents

Purpose

The Environmental Protection Agency (EPA), under the Toxic Substances Control Act (TSCA), has determined that methylene chloride, also known as dichloromethane (DCM), poses an unreasonable risk of injury to health – cumulative exposures to DCM may cause cancer and damage to the liver and kidneys. Acute exposures to high concentrations of DCM vapor in poorly ventilated spaces may cause central nervous system harm, up to and including unconsciousness and death through respiratory paralysis.

The EPA has identified a limited number of applications that may continue. A Workplace Chemical Protection Program (WCPP) is required for those entities that will continue using DCM under these allowable uses. The University of Georgia has implemented the following requirements to satisfy this obligation in lab-teaching and research laboratory spaces.

Definitions, Roles and Responsibilities

- **As needed monitoring** - Exposure measurements taken when there is a change of use.
- **De minimis** - The threshold concentration for which regulatory restrictions are not required. For DCM this concentration is 0.01% by weight.
- **Exposure Control Plan (ECP)** - This documents actions taken to mitigate occupational exposures and comply with the WCPP at the lab, department, college or institute level.
- **Owners / operators** - Anyone who owns, leases, operates, controls, or supervises a workplace. This includes the University of Georgia and each PI, instructor, or supervisor who oversees a location where DCM is used or a person who uses DCM. The University of Georgia is responsible for writing and updating this Program. PIs, instructors, and supervisors are responsible for implementing this Program and for approving and enforcing any Exposure Control Plans applicable to their work area.
- **Periodic monitoring** - Dependent upon the results of the initial and/or repeat monitoring; the frequency for gathering new monitoring data ranges from 3 months to 5 years.
- **Potentially exposed person** - Any person who may be exposed to a chemical or mixture in a workplace as a result of a condition of use of that chemical substance or mixture. This applies regardless of whether a person is a user of the chemical or an employee. Potentially exposed persons are responsible for complying with the provisions of this program.
- **Prohibited uses** - the EPA has established exposure limits for DCM for some conditions of use, including “use as a laboratory chemical.” Nearly all other commercial and industrial uses, such as use as a solvent or paint remover, are prohibited. EPA has a full list of prohibited uses in its Guide to Complying with the 2024 Methylene Chloride Regulation.

- **Regulated area** - An area demarcated where airborne concentrations exceed, or there is a reasonable possibility they may exceed, the Existing Chemical Exposure Limit (ECEL) of 2 ppm or EPA Short Term Exposure Limit (STEL) of 16 ppm.
- **Retailer** - An entity that distributes or makes available products to consumers.
- **Time-Weighted Average (TWA)** - The potentially exposed person's average airborne exposure in any 8-hour work shift of a 40-hour work week (8-hour TWA), or in any 15-minute reference period covering a specific task where airborne concentrations may instantaneously exceed the full-shift exposure limit (15-minute TWA).
- **Workplace Chemical Protection Program (WCPP)** - A written program or document to protect potentially exposed persons in the workplace who are engaged in conditions of use that are not prohibited.

Exposure Limits

Under this program, long-term exposures to DCM will be kept below 2 ppm (8-hour TWA) and short-term exposures will be kept below 16 ppm (15-minute TWA). Additional monitoring will be implemented whenever long-term exposures exceed 1 ppm. Any deviation from these limits must be approved by the Office of Research Safety (ORS) and will be documented in the lab or department's written Exposure Control Plan. This documentation will include a respiratory protection program to be implemented in work areas receiving a variance.

Exposure Monitoring

Monitoring Requirements

Initial monitoring for DCM is required to establish a baseline for DCM users and to inform the development of the Exposure Control Plan (ECP). All initial monitoring shall be conducted by May 5, 2025, or within 30 days after the introduction of DCM in the workplace. Initial monitoring results will be used to determine the frequency of compliance activities such as periodic monitoring. Monitoring must be done when and where operating conditions are representative of each potentially exposed person's highest likely full shift and 15-minute exposure.

Exemptions to Initial Monitoring

Two conditions can exempt an employer from conducting initial monitoring for DCM.

1. If objective data generated during the last 5 years demonstrates DCM is not released in the workplace environment at or above the ECEL action level and EPA STEL and with initial monitoring conducted within 5 years of that data.
2. If exposure to DCM is less than 30 days per year with two conditions:
    a. Direct reading measurements must be taken in the environment to ensure levels are below the ECEL action level and EPA STEL.
    b. Appropriate controls must be put in place to ensure levels are below the ECEL and EPA STEL.

Initial and Periodic Monitoring
The results of initial monitoring will determine how frequently periodic monitoring must occur. Periodic monitoring can range from every 3 months, every 6 months, 1 year or every 5 years depending on the following conditions:

Monitoring frequency will be based on initial monitoring results.

DCM Concentration (initial exposure monitoring results)			**Re-monitoring Frequency**
8-hr TWA (ECEL)		**15-min TWA (STEL)**	
< 1 ppm	and	≤ 16 ppm	ECEL and EPA STEL periodic monitoring at least once every 5 years
< 1 ppm	and	> 16 ppm	ECEL monitoring at least once every 5 years AND EPA STEL periodic monitoring required every 3 months
≥ 1 ppm & ≤ 2 ppm	and	≤ 16 ppm	ECEL monitoring every 6 months
≥ 1 ppm & ≤ 2 ppm	and	> 16 ppm	ECEL periodic monitoring every 6 months and immediate suspension of tasks causing the 15-min TWA to exceed 16 ppm in the monitored lab
> 2 ppm			Immediate suspension of use of DCM in the monitored lab

Changes in Conditions
The frequency of periodic monitoring may be reduced if **two consecutive samples** taken at least **7 days apart** show the 8-hour TWA exposure has decreased from between 1 and 2 ppm to below 1 ppm.

Lifting of a suspension of DCM use similarly requires that **two consecutive samples** taken at least **7 days apart** show the 8-hour TWA exposure has decreased to below 2 ppm AND that the 15-minute TWA exposure has decreased to below 16 ppm.

Suspension of Periodic Monitoring
Monitoring may be suspended if work with DCM will not occur during the timeframe where monitoring would be required under this plan. In this case, the next use of DCM must be monitored.

Sampling Requirements
The following sampling guidelines must be followed for every potentially exposed person.

1. Sampling Requirements:
    a. Air sampling must be conducted for every potentially exposed person or a representative sample representing all exposed persons.
    b. Sampling must be taken when and where the operating conditions are representative of the highest potential full shift exposures.
    c. All potentially exposed persons must be given the opportunity to observe exposure monitoring.
    d. Must be taken at the personal breathing zone.
    e. Notification of monitoring results to monitored person and potentially exposed persons (e.g., similar exposure group) within 15 working days after receipt of results.
2. Sampling Report:
    a. Provide the ECEL, action level, EPA STEL, and significance of each.
    b. Provide the quantity, location, and manner of DCM use at the time of monitoring.
    c. Provide the monitoring results.
    d. Indicate whether the concentration exceeds the ECEL, action level, and EPA STEL.
    e. Provide a description of actions taken to reduce exposure to below exposure limits.
    f. Provide a description of the respiratory protection measures if needed.
    g. List any identified releases of DCM during monitoring.

Regulated Areas

A regulated area must be established wherever airborne concentrations of DCM exceed, or could reasonably be expected to exceed, the ECEL of 2 ppm or STEL of 16 ppm based on monitoring. Regulated areas are only allowed by variance under this Program, with additional required controls as outlined below.

Establishing Regulated Areas
Regulated areas must be established and clearly demarcated by signage indicating use of DCM in the area. Signage serves to alert potentially exposed persons to the boundaries of the area and minimizes the number of exposed persons.

The exact wording will be tailored for each area and may be in multiple languages as needed. An example of wording is the following:

Methylene Chloride Warning

- Authorized Personnel Only
- Airborne Concentrations may exceed:

2 ppm (8-hour average) -OR-

16ppm (15 min average)

Avoid Exposure

- Follow Safety Protocols
- Respiratory Protection Required When Methylene Chloride is in Use

Access Control
Only authorized personnel may enter a regulated area. These personnel must receive DCM-specific training, including hazard communication, safe handling practices, emergency procedures, and proper use of PPE prior to entering the regulated area.

Respiratory Protection
A NIOSH Approved Supplied-Air Respirator (SAR) or Self-Contained Breathing Apparatus (SCBA) is required to enter a regulated area. ORS assesses each use case and determines the appropriate respiratory protection based on the EPA rule as part of **the University of Georgia**'s Respiratory Protection Program.

Training and Information

The EPA rule includes requirements for training and references the OSHA Methylene Chloride Standard training requirements. Both EPA and OSHA reference general training requirements (e.g., nature of training required, frequency, *etc.*) as well as task-specific training. As such, training may be provided from a centralized, institutional level and/or at the lab-specific level by PIs, instructors, and supervisors who oversee the assignment of tasks in the lab.

Dichloromethane Training

Training for DCM use at **the University of Georgia** must be developed and delivered by the laboratory PI or their designee. A template is maintained on UGA's Learning Management System that researchers can use to conduct their training. The training shall cover these requirements:

1. Training shall be consistent with OSHA's Methylene Chloride Standard 1910.1052(l)(1) through (6), including completing training prior to initial job assignment.
2. Training must be documented in lab records (either on paper or electronically) and made available to the Office of Research Safety upon request.
3. Must be done in a comprehensive manner that is understandable to potentially exposed persons.
4. Shall cover hazards associated with DCM as required by the OSHA Hazard Communication Standard 1910.1200(b)(3)(iii) and/or lab's chemical safety plan.
    a. Dermal protection must cover glove selection (type and material), use, expected duration of glove effectiveness, actions to take when glove integrity is compromised, storage, procedure for glove removal, disposal, and chemical hazards.

    b. Inhalation protection training must occur annually if respiratory protection is required. It must cover medical requirements, fit testing procedures, hazards, use of respirator, donning/doffing of respirator, limitations, maintenance, and storage.
    c. Personal Protective Equipment training should cover selection, use, inspections, and replacement schedules. Any task or activity-specific PPE required, and location of PPE must also be covered.
    d. Exposure controls required during tasks with DCM, and training on how to use those controls (e.g., appropriate fume hood sash level).
    e. The PI, instructor, or supervisor shall ensure that only individuals trained in DCM safety are allowed to perform DCM tasks.
5. Training is required to be repeated as necessary to maintain requisite knowledge of safe use and handling.
6. Employees for whom exposure monitoring results exceed the EPA action level or EPA STEL shall be re-trained as necessary to ensure that each employee maintains the requisite understanding of the principles of safe use and handling of DCM.
7. When there are workplace changes, such as modifications of tasks or procedures or new procedures, which can reasonably be expected to increase the exposure level, the employer shall update the training as necessary to ensure that each affected employee has the requisite proficiency.

Each lab, department, or unit must maintain an Exposure Control Plan (ECP) documenting actions taken to mitigate occupational exposures and comply with this WCPP. This plan must be kept on file with the Office of Research Safety. If tasks are modified or new tasks are initiated, the PI, instructor, or supervisor must update the ECP within 30 days of the initiation of the changes.

Recordkeeping

Compliance records must be retained for a period of five years. Owners and operators, including each PI, instructor, or supervisor who oversees a location where DCM is used or a person who uses DCM, are required to participate in generation and maintenance of these records, as they are crucial in proving adherence to the restrictions set forth by the EPA. This WCPP is maintained by UGA's Office of Research Safety.

Timeline for Compliance

- By May 5, 2025, complete initial monitoring:
    - Within 15 days of monitoring, notify monitored persons and similar exposure group of the results.
    - Within 90 days of monitoring, provide any required PPE and establish any regulated areas.
- By October 30, 2025, write and implement the Exposure Control Plan(s).
- By April 28, 2026, cease use and dispose of DCM for prohibited uses (non-laboratory use).

References

- Ansell Chemical Glove Resistance Guide
- A Guide to Complying with the 2024 Methylene Chloride Regulation
- EPA Fact Sheet: Methylene Chloride or Dichloromethane
- FACT SHEET: 2024 Final Risk Management Rule for Methylene Chloride under TSCA
- Methylene Chloride Hazards for Bathtub Refinishers
- Preliminary Information on Manufacturing, Processing, Distribution, Use, and Disposal: Methylene Chloride
- Risk Evaluation for Methylene Chloride - See Appendix F for details on glove materials