



Laboratory Standard Operating Procedure for:

# Methylene Chloride

## Description

*This standard operating procedure outlines the handling and use of methylene chloride. Review this document and supply the information required in order to make it specific to your laboratory. In accordance with this document, laboratories should use appropriate controls, personal protective equipment, and disposal techniques when handling methylene chloride.*

Methylene chloride (CAS # 75-09-2) is a colorless liquid with a mild, sweet (“chloroform-like”) odor that can be detected as low as 0.9 ppm (odor threshold). It is often used as an industrial solvent, for metal cleaning and degreasing and in various paint strippers. It may also be found in some aerosol and pesticide products and is used in the manufacture of photographic films.

Synonyms include: Methane dichloride; Methylene bichloride; Methylene dichloride; Dichloromethane; DCM; MeCl & MeCl<sub>2</sub>.

## Useful Methylene Chloride Links:

- <http://www.osha.gov/Publications/osa3144.html>
- [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=STANDARDS&p\\_id=10095](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10095)
- <http://www.atsdr.cdc.gov/tfacts14.pdf>
- <http://www.cdc.gov/niosh/topics/methylenechloride/>

## Potential Hazards

- Methylene chloride exposure can cause adverse health effects to the central nervous system (CNS), liver, and cardiovascular system including mental confusion, light-headedness, nausea, vomiting and headache.
- It is metabolized by the body to carbon monoxide, and therefore reduces the blood’s ability to transport oxygen. It is also a suspected carcinogen.
- Exposure may also cause eye and respiratory tract irritation.
- Skin exposure to liquid may cause irritation and skin burns after extended exposures.
- There is a substance-specific [MIOSHA standard for Methylene Chloride](#), and an action limit of 12.5 ppm.
- Consult the SDS for methylene chloride as well as the links above for more information.

## Occupational Exposure Limits (OELs):

- MIOSHA: **25 ppm, 8-hour PEL**
- MIOSHA: **125 ppm, 15-minute STEL**

## Engineering Controls

- Work with open containers of methylene chloride should be conducted only in a fume hood.
- Dilute solutions, small quantities, and closed containers of methylene chloride may be handled on the bench top.
- If it is reasonably foreseeable that an employee's **eyes** may contact solutions containing 0.1 percent or greater of methylene chloride, e.g., through splashes, spills or improper work practices, the MIOSHA methylene chloride standard requires eyewash facilities within the immediate area for emergency use. MIOSHA also requires that affected employees use these facilities as needed.

If it is reasonably foreseeable that an employee's **skin** may contact solutions containing 0.1 percent or greater methylene chloride, e.g., through splashes, spills or improper work practices, the MIOSHA methylene chloride standard requires conveniently located washing facilities capable of removing the methylene chloride. MIOSHA also requires that affected employees use these facilities as needed.

- Depending on the material's pH or based on its ability to cause severe tissue damage, e.g., formaldehyde, methylene chloride, methyl ethyl ketone peroxide (MEKP), phenol, etc., the location of the emergency shower and/or emergency eyewash shall be within [25 feet from the hazardous operation.](#)

### Work Practice Controls

- Designate an area for working with methylene chloride, and label it as such.
- Keep containers closed as much as possible. Handle open containers only in a chemical fume hood.
- Use in the smallest practical quantities for the experiment being performed.
- Typical laboratory use of methylene chloride should not put employees at risk of overexposure but labs using large amounts of methylene chloride should contact EHS at (313) 593-0921 for exposure assessment.
- Once work with methylene chloride is complete, wipe down work area with soap and water solution.
- Keep away from ignition sources. Incompatible with strong oxidizers and metals.
- Wash hands thoroughly after use. Do not eat, drink or smoke in areas where methylene chloride or other chemicals are used.

### Personal Protective Equipment (PPE)

- Methylene chloride ***readily penetrates through standard nitrile, natural rubber and polyvinyl chloride laboratory gloves.*** Therefore, Viton, Neoprene or polyethylene vinyl alcohol and ethylene vinyl alcohol (PVA/EVA) gloves are recommended.
- Employee should use double gloves prior to working with methylene chloride. Disposable gloves provide minimum protection for general laboratory use and should be changed frequently or whenever contamination is suspected.
- Safety goggles should be worn when a splash hazard exists; safety glasses with side shields (both that meet the requirements of ANSI/ISEA Z87.1) are required at a minimum when methylene chloride is used in a closed system.
- A laboratory coat should be worn when working with chemicals. A chemically resistant apron should be used if transferring or using large quantities of methylene chloride in open containers.
- Also refer to EHS's [Glove Use Webpage.](#)

### Transportation and Storage

- Transport methylene chloride in secondary containment, preferably a polyethylene or other non-reactive acid/solvent bottle carrier.
- Keep container in cool, well-ventilated area.
- Keep container tightly closed and sealed until ready for use.
- Store in secondary containment away from moisture, strong oxidizers, strong caustics, plastics, rubber, nitric acid, water + heat, and chemically active metals, such as aluminum and magnesium powder, sodium, potassium, and lithium.
- Avoid storing on the floor.
- Avoid ignition sources.

## Waste Disposal

Most spent, unused and expired materials are considered hazardous wastes and **must be collected and disposed of within 90-days** by EHS. ***Do not dispose of chemical wastes by dumping them down a sink, flushing in a toilet or discarding in regular trash containers.*** Contact EHS at (313) 593-0921 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also, refer to EHS's [Hazardous Waste Webpage](#) for more information.

## Exposures/Unintended Contact



***If the employee is in need of emergency medical attention, call 911 immediately.***



In general, flush affected eyes or skin with water for at least 15 minutes, then seek medical attention (see below).

- **Eyes:** In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. *Remove contact lenses, if present and easy to do.* Continue rinsing. Get medical aid.
- **Skin:** In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.
- **Ingestion:** If swallowed, **do not induce vomiting unless directed to do so by medical personnel.** Never give anything by mouth to an unconscious person. Get medical aid.
- **Inhalation:** If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.



***If there is any doubt about the severity of the injury, seek immediate medical attention!***



Report all work related accidents, injuries, illnesses or exposures to WorkConnections within 24 hours by completing and submitting the [Illness and Injury Report Form](#). Follow the directions on the WorkConnections website [Forms Instructions](#) to obtain proper medical treatment and follow-up.

Complete the [EHS Laboratory Incident and Near-Miss Report](#) form.

### TREATMENT FACILITIES:

#### **Midwest Medical Center -- *Campus Employees (including student employees)***

Mon-Fri 7:30 am - 4:30 pm

**9301 Middlebelt Road**

Romulus, MI 48174

Phone: 734-941-1000

After hours - go to:

#### **Midwest Medical Center**

Open 24/7

4700 Schaefer

Dearborn, MI 48126

Phone: 313-581-2600

#### **Henry Ford Medical Center-Fairlane -- *University students (non-life threatening conditions)***

19401 Hubbard Drive

Dearborn, MI 48126

Phone: 313-928-8278

Click [here](#) for more information.

## Spill Procedures

- When a spill occurs, ***personal safety should always come first.***
- Alert and clear everyone in the immediate area where the spill occurred.

A **minor (small) chemical spill** is one that the laboratory staff is capable of handling safely without the assistance of safety and emergency personnel, i.e., (*less than 1 Gallon or 3.5 Liters*). A **major/large chemical spill** requires active assistance from emergency personnel.

## Spill Response Steps:

### MINOR CHEMICAL SPILL

- Alert people in immediate area of spill.
- Open outside windows, if possible.
- Use proper personal protective equipment (PPE) as indicated above.
- Avoid breathing vapors from spill.
- Confine spill to as small an area as possible.
- **Do not wash spill down the drain.**
- Use appropriate spill kits/sorbents to absorb spill. Collect contaminated materials and residues and place in container. Contact EHS at (313) 593-0921 for proper disposal.
- Clean spill area with water.

### MAJOR CHEMICAL SPILL

Report large chemical spills (*greater than 1 Gallon or 3.5 Liters*) in corridors or common areas, e.g., hallways, elevators, eating areas, rest rooms, offices, etc., to Public Safety at (313) 593-5333 or 911 from a campus phone.

- Attend to injured or contaminated persons and remove them from exposure.
- Alert people in the laboratory to evacuate.
- If spilled material is flammable, turn off ignition and heat sources. Don't light bunsen burners or turn on other switches.
- **Call Public Safety at (313) 593-5333 or 911 from a campus phone immediately for assistance.**
- Close doors to affected area.
- Post warnings to keep people from entering the area.
- Have person available that has knowledge of incident and laboratory to assist emergency personnel.

## Additional Spill Links:

- [Chemical Spill Control Information](#)

Report all emergencies, suspicious activity, injuries, spills, and fires to Public Safety by calling at (313) 593-5333 or 911 from a campus phone. Register with the University of Michigan-Dearborn [Emergency Alert System](#).

## Training of Personnel

All personnel are required to complete the ***Comprehensive Laboratory Safety*** session (**BLS009** or equivalent) via [MyLINC](#). Furthermore, all personnel shall read and fully adhere to this SOP when handling methylene chloride.

**Certification**

I have read and understand the above SOP. I agree to contact my Supervisor or Lab manager if I plan to modify this procedure.

Name	Signature	UM ID #	Date

**Prior Approval required – Is this procedure hazardous enough to warrant prior approval from the Principal Investigator?**      ☐ YES      ☐ NO

**Principal Investigator** \_\_\_\_\_

**Revision Date** \_\_\_\_\_