



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 & MeCl₂.

Useful Methylene Chloride Links:

- <http://www.osha.gov/Publications/osh3144.html>
- 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 Environment, Health and Safety at **(810) 766-6763** 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 [OSEH's Glove Compatibility Charts 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. Contact Environment, Health and Safety (EHS) at (810) 766-6763 for waste containers, labels, manifests, waste collection and for any questions regarding proper waste disposal. Also refer to UM-Flint Hazardous Waste Management Program and EHS webpage <http://www.umflint.edu/ehs/environment-health-and-safety> 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



Contact EHS for advice on symptoms of chemical exposure, or assistance in performing an exposure assessment.

Report all work related accidents, injuries, illnesses or exposures to UM-Flint DPS. Additionally, employees and supervisors must be sure to report the injury to EHS and complete and submit the [Illness and Injury Report Form](#) to WorkConnections within 24 hours. Follow the directions on the WorkConnections website [Forms Instructions](#) to obtain proper medical treatment and follow-up.

If you were involved in or observed an incident or near miss, please complete the [EHS Laboratory Incident and Near-Miss Report Form](#). This will be valuable in improving laboratory safety on UM-Flint campus.

TREATMENT FACILITIES:

<u>MAJOR INJURIES</u>	<u>MINOR INJURIES –During Business Hours</u>	<u>MINOR INJURIES –After Business Hours</u>
Genesys Hospital One Genesys Parkway Grand Blanc, MI 48439 (810) 606-5710 Hurley Medical Center One Hurley Plaza Flint, MI 48503 (810) 262-9000 McLaren Hospital Flint 401 South Ballenger Hwy Flint, MI 48532 (810) 342-2000	Genesys Occupational Health Network 1460 Center Rd. Burton, MI 48509 (810) 715-4620 Mon. to Fri. 7:30 am to 10 pm Sat. & Sun. Noon to 8 pm McLaren Flint-Burton OCC Center 1459 S. Center Rd. Burton, MI 48509 (810) 496-0900 Mon. - Fri. 8 am to 8 pm Sat & Sun 10 am to 2 pm	Downtown Flint 420 S. Saginaw St. Flint, MI 48502 (810) 762-1550 Genesys East 1096 S. Belsay Rd, Suite F Burton, MI 48509 (810) 743-3351 Genesys North 4154 W. Vienna Rd Clio, MI 48420 (810) 686-7397 Genesys South 8447 N. Holly Rd Grand Blanc, MI 48439 (810) 603-0856 Mon. - Fri. 6 to 10pm / Sat. & Sun. 1-10pm

Click [here](#) for more information on the UM – Flint Emergency Preparedness and Response Plan.

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 of a known chemical 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 (810) 766-6763 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 UM-Flint Department of Public Safety (DPS) at (810) 766-6763 (*or 911*).

- 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 UM-Flint DPS at 911 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:

- www.oseh.umich.edu/pdf/chemspil.pdf
- <http://www.oseh.umich.edu/emer-chemical.shtml>

Report all emergencies, suspicious activity, injuries, spills, and fires to the UM-Flint Department of Public Safety (DPS) at 911 from any university telephone or (810) 762-3333 from cell phone or non-university telephone. Register with the [University of Michigan-Flint Emergency Alert System](#) via Wolverine Access. Also, preprogram the UM-Flint DPS telephone number (810) 762-3333 into your cell phone for quick, easy use.

Training of Personnel

All personnel are required to complete Laboratory Safety Training. Documentation of the training is required. This training can be accomplished by completing the **Comprehensive Laboratory Safety** session (**BLS009** or equivalent) via [MyLINC](#), or UM-Flint EHS on-line training or other equivalent approved by EHS. 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 _____