**Workplace Chemical Protection Program (WCPP)**

**Methylene Chloride**

The WCPP is a program to protect potentially exposed persons in the workplace and who are engaged in the use of methylene chloride. All researchers unable to eliminate methylene chloride from their processes must develop and implement a WCPP to limit employee exposure. The NDSU Safety Office will assist in WCPP implementation and provide resources where possible.

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| Department: | Click here to enter text. | | |
| Location: | Click here to enter text. | | |
| Principal Investigator (PI): | Click here to enter text. | | |
| PI Office Phone: | Click here to enter text. | PI Home Phone: | Click here to enter text. |
| Emergency Contact Name: | Click here to enter text. | Emergency Contact Phone: | Click here to enter text. |
| Safety Office Phone: | 701-231-7759 | University Police Phone: | 701-231-8998 |

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| 1. WCPP OVERVIEW |

**The WCPP Will Include:**

* **Initial monitoring**- (SECTION 2)
* **Periodic Monitoring**- (SECTION 2)
* **Recordkeeping and Downstream Notification** – (SECTION 2)
* **Hazards Identification** – (SECTION 3)
* **Exposure Control Plan**- (SECTIONS 4 – 11)
* **Establishment of a regulated area**- (SECTION 4)
* **Training**- (SECTION 7)
* **Respiratory Protection and Personal Protective Equipment (PPE)**- (SECTION 8)

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| 2. EXPOSURE MONITORING, RECORDKEEPING, & NOTIFICATION |

*\*All costs associated with monitoring are the responsibility of the user*

**Initial Monitoring:**

* All employees or a single individual in an area representing the worst-case scenario will be monitored by the Safety Office for methylene chloride exposure.
* PIs or lab supervisors are required to inform the Safety Office of methylene chloride use in their labs or work areas by completing the Methylene Chloride Use Survey online.
* Lab supervisors or PIs must report any changes to existing protocols or new uses of methylene chloride to ensure proper exposure monitoring is conducted.

**Periodic Monitoring:**

* Restricted areas will be monitored periodically by Safety Office staff for inhalation exposure depending on risk or if there are procedural changes.
* Exposure levels below the action limit (1 ppm) for the 8-hour TWA and at or below the STEL (16 ppm) will be monitored every 5 years.
* Exposures above these limits will require monitoring every 3 or 6 months depending on severity.

**Recordkeeping and Notification:**

* The NDSU Safety Office will maintain records of exposure monitoring for methylene chloride storage and use areas.
* The NDSU Safety Office will notify potentially exposed persons of results of workplace exposure monitoring activities, workplace exposure incidents, and steps taken to protect workers from exposure to methylene chloride.

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| 3. HAZARDS INDENTIFICATION | | | | |
| Chemical Name | **CAS Number** | | **Quantity Stored** |
| Methylene Chloride, Dichloromethane (DCM) | 75-09-2 | | Enter quantity and units |
|  | | | | |
| https://www.osha.gov/images/Healthhazard_big.jpgC:\Users\zsmith\Desktop\GHS\Expoint_big.jpg | | Signal Word: Danger | | |
| GHS Hazard Statements:   * Causes skin irritation * Causes serious eye irritation * May cause drowsiness or dizziness * Suspected of causing cancer * May cause damage to organs through prolonged or repeated exposure | | |
| Exposure Limits | | | | |
| 8-Hour Time Weighted Average (TWA) (EPA ECEL) | | 2 ppm | | |
| 15-Min Short-Term Exposure Limit (STEL) (EPA) | | 16 ppm | | |
| Action Level (EPA) | | 1 ppm | | |

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| Chemical and Physical Properties | |
| Molecular Formula | CH2Cl2 |
| Hazard Class | Carcinogen, Acute Toxicity |
| Form/Physical State | Liquid |
| Boiling Point | 39.6C |
| pH | NA |
| Odor | Sweet, Chloroform-like |
| Flash Point | Non-flammable |
| Vapor Pressure | 47.33 kPa at 25 °C |

**EXPOSURE CONTROL PLAN**

The exposure control plan must describe efforts that will be taken to protect potentially exposed persons through use of the hierarchy of controls. The hierarchy of controls specifies that labs should first attempt elimination, substitution, then engineering controls, administrative controls, and work practices to manage methylene chloride exposure to the extent feasible prior to requiring use of PPE as a means of controlling inhalation exposures. Ensure that engineering and administrative controls are applied to reduce exposure below the ECEL and EPA STEL.

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| 4. REGULATED STORAGE AND USE LOCATIONS | |
| Regulated Work and Storage Locations | Enter building, room number, & specific areas |
| Storage Conditions | Store in a cool, well-ventilated area, in tightly sealed containers, away from direct sunlight, acids, and bases.  Storage areas should clearly be indicated with methylene chloride signage.  Methylene chloride should not be stored in open containers or squirt bottles. |

Areas where methylene chloride is in use will be marked as a designated area with restricted access.

[Provide a description of regulated areas, how they are marked, and persons authorized to enter the regulated areas]

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| 5. ELIMINATION/SUBSTITUTION |

**Elimination:**

Remove methylene chloride at the source. This could include changing the work process to stop using methylene chloride. Elimination is the preferred solution to protect potentially exposed persons because no exposure can occur.

**Substitution:**

Use a safer alternative to methylene chloride. When considering a substitute, compare the potential risks of the substitute to those of methylene chloride. This review should consider how the substitute will combine with other agents in the workplace. Effective substitutes reduce the potential for harmful effects and do not create new risks. The EPA recommends careful review of the available information on potential substitutes to avoid a substitute chemical that might later be found to present unreasonable risks or be subject to regulation.

**[Laboratories must make efforts to eliminate or substitute methylene chloride in their lab processes. If your lab is unable to dispose or discontinue use of methylene chloride, describe why these control measures were not feasible, not effective or otherwise not implemented.]**

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| 6. ENGINEERING CONTROLS |

**Engineering Controls**

* Use fume hoods or glove boxes **at all times** when working with methylene chloride to ensure proper ventilation.
* Closed Systems: Use closed systems (e.g., sealed reaction vessels or containers) to handle methylene chloride whenever feasible to reduce vapor release.
* Ensure that local exhaust is active when using the chemical in open systems or non-enclosed equipment.
* Laboratory fume hoods must be operational and tested annually by the NDSU Safety Office. Contact the Safety Office for additional testing.
* Emergency overrides and interlocks must be accessible to shut down processes if there is a risk of overexposure.

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| 7. WORK PRACTICE CONTROLS & TRAINING |

**Precautions for Safe Handling:**

* Ensure all personnel are familiar with the specific handling of methylene chloride, and disposal of methylene chloride waste.
* Ensure all regulated storage and use locations are clearly identified using signage.
* Restrict the use of methylene chloride to specific, clearly marked areas (e.g., within fume hoods or specially regulated areas of the lab).
* Restrict access to regulated areas by any person that lacks training, PPE, or for any reason is unauthorized to enter.
* Avoid inhalation of vapors and prevent contact with skin and eyes.
* Use the minimum amount of methylene chloride necessary for the task at hand.
* Minimize open container time: keep methylene chloride containers closed when not in use. Open containers only as long as needed to prevent vapor release.
* Routine Inspection and Maintenance: Ensure regular inspection of ventilation systems, fume hoods, and PPE to verify they are working effectively. Any equipment malfunction can result in increased exposure.
* Prohibit Eating/Drinking in Lab: Ensure no food, drinks, or personal items are stored or consumed in the lab where methylene chloride is used.
* Handwashing Practices: Encourage frequent handwashing, especially before eating or touching the face and after handling methylene chloride to avoid contamination.

**Training Requirements:**

Staff will undergo training prior to working in methylene chloride restricted areas.

Laboratory Safety Training\*

Laboratory Specific Safety Training (Provided by PI or Lab Supervisor)

Hazardous Waste Handling Training\*

Biosafety Training\*

Bloodborne Pathogen Training\*

Radiation Safety Training\*

Nanomaterial Safety Training\*

Methylene Chloride Safety Training\*

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\*Training is provided by the Safety Office: https://www.ndsu.edu/police\_safety/training/

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| 8. PERSONAL PROTECTIVE EQUIPMENT |

Long pants, closed toe shoes, and safety glasses are required upon entry into an area where hazardous materials are used or stored. Additional PPE requirements are listed below. Principle investigators or lab supervisors are responsible for supplying PPE and training lab users in PPE use, limitations and storage.

**Eye Protection**

* ANSI Z87.1 Safety Glasses required at all times.
* Splash Goggles are required for all processes with potential chemical splash hazards or aerosols.
* Splash Goggles AND Face Shield provide the greatest protection from chemical splash hazards.

**Hand Protection**

* Gloves must be worn when handling chemicals.
* Use **chemical-resistant gloves** such as polyvinyl alcohol (PVA) or Silver Shield.

**Skin and Body Protection**

* Long pants and closed toe shoes must be worn at all times.
* Laboratory coats are required when working with hazardous materials.
* Flame-resistant laboratory coats should be worn for increased risk of fire.
* Face shield, chemically-resistant apron, disposable sleeves, etc. are required where splashes or skin contact is possible.

**Respiratory Protection**

* Supplied air respirators required when exposure exceeds acceptable levels determined by the EPA (must be fit-tested, trained, and cleared by Safety Office).
* Air-purifying respirators CAN NOT be used due to short service life of chemical cartridges when used for methylene chloride.

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| 9. EMERGENCY RESPONSE |

**Emergency Safety Equipment**

[List all required safety equipment and locations. All personnel must be aware of emergency equipment locations and emergency response procedures.]

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| **Emergency Equipment** | **Location** |
| Emergency Eyewash Station(s) | Click here to enter text. |
| Safety Shower | Click here to enter text. |
| First Aid Kit | Click here to enter text. |
| Fire extinguisher | Click here to enter text. |
| Fire Alarm Pull Station | Click here to enter text. |
| Telephone | Click here to enter text. |
| Add/Delete Rows as necessary | Click here to enter text. |

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| Chemical Exposure |

**Symptoms of acute exposure to methylene chloride:**

* **Inhalation**: Dizziness, headaches, confusion, nausea, shortness of breath, unconsciousness in extreme cases.
* **Skin Contact**: Irritation, redness, or burning sensation.
* **Eye Contact:** Severe irritation, redness, watering, and possible chemical burns.
* **Ingestion:** Nausea, vomiting, abdominal pain, central nervous system depression.

**If Inhaled:**

* Immediately move the affected person to fresh air.
* If breathing is difficult or has stopped, administer artificial respiration or oxygen if trained to do so.
* Call 9-1-1 or University Police at 701-231-8998.
* Seek medical attention immediately, even if symptoms appear mild.

**In Case of Skin Contact:**

* Immediately flush all affected areas with water for 15 minutes using the nearest sink or safety shower.
* Remove any contaminated clothing.
* Seek medical attention.

**In Case of Eye Contact:**

* Flush eyes with copious amounts of water for at least 15 minutes in the emergency eyewash station. Ensure eyelids are held open during flushing.
* If applicable, wash hands and remove contact lenses while flushing with water.
* Seek medical attention.

**If Ingested:**

* Seek medical attention immediately.
* Do not induce vomiting.
* Rinse mouth with water.
* Do not give anything by mouth to an unconscious person.

**REPORT ALL INCIDENTS TO THE NDSU SAFETY OFFICE WITHIN 24 HOURS.**

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| Chemical Spills |

NDSU Safety Office is available for spill clean-up 24/7. Call 701-231-7759 for assistance in cleaning up any spill.

**ALL Chemical Spills (Methylene Chloride)**

1. Notify others and evacuate the lab.
2. Is there an immediate threat of fire or explosion?
   1. YES: Pull the fire alarm and call 9-1-1.
   2. NO: Call the Safety Office Spill Team at 701-231-7759

**REPORT ALL INCIDENTS TO THE NDSU SAFETY OFFICE WITHIN 24 HOURS.**

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| Life Threatening Emergencies |

**Fire, explosion, life-threatening hazardous material spill/leak, compressed gas leak, etc.:**

1. Call 9-1-1 or University Police 701-231-8998
2. Alert others in the area and activate local alarm systems (e.g., fire alarm pull stations)
3. Evacuate building to designated assembly point: Enter Designated Assembly Point
4. Remain at the designated assembly point to advise emergency responders.
5. Call the Safety Office at 701-231-7759, when it is safe to do so.

**Injuries:**

1. Call 9-1-1 or University Police 701-231-8998.
2. Administer first aid as appropriate.
3. Call the Safety Office 701-231-7759, when it is safe to do so.

**REPORT ALL INCIDENTS TO THE NDSU SAFETY OFFICE WITHIN 24 HOURS.**

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| 10. WASTE DISPOSAL |

Hazardous wastes must be stored and labeled properly and disposed of by the NDSU Safety Office within 9 months of accumulation start date.

* Methylene chloride waste should be minimized and segregated from other waste streams whenever possible.
* Methylene chloride waste should be stored in regulated methylene chloride use areas.

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| 11. LAB SPECIFIC PROCEDURES |

**Laboratory Specific Procedures:**

[List your detailed laboratory specific procedures in this section. Remember, any changes to these procedures require advance PI approval]

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| 12. APPROVAL & DOCUMENTATION | |
| WCPP Approval | |
| Date WCPP was approved by PI: | Click here to enter text. |
| Date of Last WCPP Revision by PI: | Click here to enter text. |
| Click here to enter text. | Click here to enter text. |

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| DOCUMENTATION OF TRAINING | |
| All laboratory personnel must read and understand this WCPP, and sign/date below. | |
| NAME | **DATE** |
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**DANGER!**

**METHYLENE CHLORIDE**

**REGULATED STORAGE/USE AREA**

**RESTRICTED ACCESS**

**TOXIC BY INHALATION, SKIN CONTACT, AND INGESTION**

**CAN CAUSE RESPIRATORY ISSUES, LIVER DAMAGE AND CANCER**

**PRECAUTIONARY STATEMENTS:** Inhalation of vapors may cause nausea, vomiting, lightheadedness, or headache. Liquid may be irritating to skin, eyes and mucous membranes.

**FIRST AID PROCEDURES:** IF INHALED, Move to fresh air immediately. If breathing is difficult, give oxygen; if stopped, perform CPR and seek emergency help. IF SKIN/EYE CONTACT, remove contaminated clothing and rinse skin/eyes with water for 15 minutes. Get medical help.

**CHEMICAL SPILL:** Evacuate laboratory and call NDSU Safety Office IMMEDIATELY 701-231-7759