This document is an addendum to the UC Santa Barbara Chemical Hygiene Plan, and covers additional information on the safe handling and storage of the materials described beyond the practices described therein. Users must be familiar with the UC Santa Barbara Chemical Hygiene Plan before utilizing this SOP.

Standard Operating Procedure

Dichloromethane

(Methylene Chloride)

Overview

Dichloromethane is an anesthetic. Inhaling the vapor can cause light-headedness leading to unconsciousness and even death. Other symptoms of exposure include skin, eye and respiratory tract irritation. Strong evidence supports that dichloromethane is a human carcinogen upon chronic exposure. Its high volatility makes it imperative that it be handled in a fume hood or other vapor-capturing device. Unlike many organic solvents, dichloromethane is not flammable. Dichloromethane is considered a Particularly Hazardous Substance (PHS).

Purpose

Solvent to be used as a welding acrylic. This SOP describes the steps for safely using DCM to bond acrylic panels for constructing boxes.

Special Handling and Storage Concerns

Personal Protective Equipment

- Standard Lab Coat.
- Butyl, Viton® and polyvinyl alcohol gloves are recommended. Standard nitrile and neoprene lab gloves are NOT recommended. Single use gloves (nitrile), at least 8 mils thick. (Note: nitrile gloves provide only incidental contact protection. Better protection from fluorinated rubber gloves).
- ANSI Z87.1-compliant safety glasses. Safety goggles if a large splash hazard is present.

Special Storage Requirements

Dichloromethane is a PHS. Each container must include all applicable hazard warnings. It is recommended that the appropriate GHS pictograms also be on the container. The storage area must be within a PHS designated area, and all containers stored in secondary containment.

Engineering Controls

Fume Hood: Dichloromethane *must* be handled in a fume hood. If this is not possible due to scale or equipment, contact EH&S to determine alternate ventilation/isolation approaches or respiratory protection needs.

Administrative Controls

Restricted Access: Restrict shop access within the vicinity of DCM-related work. Utilize floor marking or caution tape and communicate with shop users.

Training: Conduct documented “hands-on” training following the communication of hazards/controls.

Special Handling Considerations

Only use dichloromethane in a PHS in a designated area. This designated area may be the entire laboratory, or only a portion of it.

Decontamination

Standard decontamination procedures apply. Use great caution in avoiding exposure.

Standard Operating Procedure

Procedure

1) Retrieve the DCM tools from the fume hood, which includes a glass syringe with bent needle and the glass vial of DCM.

2) Thoroughly clean the acrylic surfaces to be bonded.

3) Fixture two acrylic panels such that the surfaces to be bonded are in contact with proper alignment.

4) Withdraw 1-2mL of DCM from the glass vial using the glass syringe. Once you have, hold the syringe with the needle facing up or on its side until you are ready to use it. DCM is very thin and will drip from the needle while the syringe is vertical.

5) When you are ready to make the bond, hold the syringe vertically and steadily drag the needle point along the seam to be bonded. DCM will wick from the needle to the seam. Do not disturb the joint for at least 30 seconds after bonding. (24 hours for full strength)

6) When you are finished with all bonding, dispense remaining DCM back into the glass vial.

7) Return DCM tools beneath the fume hood.

Waste Management

Contact EH&S for proper disposal of hazardous waste.

First Aid and Emergencies

Spill

Treat all spills of DCM as major spills. Do not attempt to clean up the spill yourself. Notify others in the area of the spill, including your supervisor. Evacuate the area and call 911. Remain on-site at a safe distance to provide detailed response to first responders. Report any exposures to EH&S.

Fire

Dichloromethane, itself, is not flammable or explosive in air.

Personnel Exposure

Skin or eye contact: Remove contaminated attire. Flush affected area with water for 15 minutes. If symptoms persist, get medical attention.

Inhalation: Move person to fresh air. Consult a physician is symptoms persist.

Ingestion: DO NOT induce vomiting. Rinse mouth with water. Consult a physician.

This document is an addendum to the UC Santa Barbara Chemical Hygiene Plan, and covers additional information on the safe handling and storage of the materials described beyond the practices described therein. Users must be familiar with the UC Santa Barbara Chemical Hygiene Plan before utilizing this SOP.

Shop Specific Information

Prior Approval Required

☐ **NO**

☒ **YES (describe):** Methylene chloride regulation under the toxic substances control act written by the EPA. Approval for working with chemical is required by EH&S.

Designated Area

☐ **Entire Laboratory Area**

☒ **Other (describe):** All DCM work is to be performed in a fume hood over a piece of clean butcher paper. Restrict access from other shop users during DCM-related work.

Job Hazard Analysis

CNSI Microfluidics Lab – DCM Use Job Hazard Analysis (JHA)	**Developed by: Brian Dincau** **CNSI Microfluidics Lab Shop Supervisor**	**Reviewed by: Priscilla Salcedo / Bryan Bowe** **EH&S Industrial Hygiene / Industrial Safety** **Last update: 8/15/2024**
Task	**Hazard**	**Control**
(1) Withdraw DCM	-Contact with DCM **Danger** Causes skin and serious eye irritation. May cause drowsiness or dizziness. May cause cancer. May cause damage to organs through prolonged or repeated exposure.	-Wear ANSI Z87.1-compliant protective eyeglasses or chemical safety goggles. -Standard Lab Coat. -Wear Butyl, Viton®, or polyvinyl gloves and protective clothing to prevent skin exposure. Nitrile gloves are not recommended. -Use an approved respirator if exposure limits listed in the SDS are exceeded or if irritation or symptoms are experienced. Contact to EH&S for to request exposure monitoring. -Ensure eyewash station is within a reasonable distance (10 seconds from workstation). -Wash with plenty of soap and water if skin contact occurs and get medical advice/attention. -Remove all clothing and wash before reuse.
(2) Application of DCM	-Contact with DCM -Inhalation of DCM -Follow the hazards above mentioned for task 1.	-Follow the controls above mentioned for task 1. -Work slowly, leave the bottle capped when not in use. -Work in Fume Hood, leave the

		bottle capped when not in use. Move to fresh air immediately if exposed and keep at rest in a position comfortable for breathing.

Required Training: List name of authorized users/lab personnel who have reviewed this document and have been trained.		
Name:	**Signature:**	**Date:**