Chemical Profiles

Methylene Chloride

On this page

What are other names or identifying information for methylene chloride?

CAS Registry No.: 75-09-2
Other Names: Dichloromethane, Methylene dichloride, DCM
Main Uses: Solvent, paint stripper, chemical and food processing.
Appearance: Colourless liquid.
Odour: Sweet, chloroform-like

Canadian TDG: UN1593

What is the WHMIS classification?

According to the Commission des normes, de l'équité, de la santé et de la sécurité du travail (CNESST), methylene chloride can be classified as:

Acute toxicity - oral - Category 4

Skin corrosion/irritation - Category 2

Serious eye damage/eye irritation - Category 2A

Carcinogenicity - Category 1B

Specific target organ toxicity - single exposure (narcotic effects) - Category 3 - Narcotic effect

The signal word is danger.

The hazard statements are:

- Harmful if swallowed
- Causes skin irritation
- Causes serious eye irritation
- May cause cancer
- May cause drowsiness or dizziness

Please note that this classification was retrieved from the CNESST site on February 22, 2023 and was established by CNESST personnel to the best of their knowledge based on data obtained from scientific literature and it incorporates the criteria contained in the *Hazardous Products Regulations* (SOR/2015-17). It does not replace the supplier's classification which can be found on its Safety Data Sheet.

What are the most important things to know about methylene chloride in an emergency?

Emergency Overview: Colourless liquid. Sweet odour. Can ignite if strongly heated. Can form very hazardous decomposition products. CONFINED SPACE HAZARD. SUSPECT CANCER HAZARD. Suspected of causing cancer. TOXIC if inhaled. May cause drowsiness and dizziness. IRRITANT. Causes moderate or severe eye and skin irritation.

What are the potential health effects of methylene chloride?

Main Routes of Exposure: Inhalation; skin contact; eye contact.

- **Inhalation:** TOXIC, can cause death. Can irritate the nose and throat. Can harm the nervous system. Symptoms may include headache, nausea, dizziness, drowsiness and confusion. Methylene chloride forms carbon monoxide in the body. Can harm the blood (decreased ability to carry oxygen).
- **Skin Contact:** SKIN IRRITANT. Causes moderate to severe irritation. Symptoms include pain, redness, and swelling. Can be absorbed through the skin, but harmful effects are not expected.
- **Eye Contact:** EYE IRRITANT. Causes moderate to severe irritation. Symptoms include sore, red eyes, and tearing.
- **Ingestion:** If large amounts are ingested: can burn the lips, tongue, throat and stomach.
- **Effects of Long-Term (Chronic) Exposure:** Can cause dry, red, cracked skin (dermatitis) following skin contact. At high concentrations: May harm the nervous system. May aggravate existing heart conditions. Conclusions cannot be drawn from the limited studies available.
- **Carcinogenicity:** Possible carcinogen. May cause cancer based on animal information.
    - International Agency for Research on Cancer (IARC): Group 2A - Probably carcinogenic to humans.
    - American Conference for Governmental Industrial Hygienists (ACGIH): A3 - Confirmed animal carcinogen.

- **Teratogenicity / Embryotoxicity:** Not known to harm the unborn child.
- **Reproductive Toxicity:** Not known to be a reproductive hazard.
- **Mutagenicity:** Not known to be a mutagen.

What are first aid measures for methylene chloride?

Inhalation: Take precautions to ensure your own safety before attempting rescue (e.g., wear appropriate protective equipment). If breathing has stopped, trained personnel should begin artificial respiration (AR). Get medical attention as soon as possible.

Skin Contact: Avoid direct contact. Wear chemical protective clothing if necessary. Take off contaminated clothing, shoes and leather goods (e.g., watchbands, belts). Immediately flush with large amounts of gently flowing water for at least 15-20 minutes. Soap and water can be used. If irritation continues, get medical attention. Double bag, seal, label and leave contaminated clothing, shoes, and leather goods at the scene for safe disposal.

Eye Contact: Avoid direct contact. Wear chemical protective gloves if necessary. Immediately flush the contaminated eye(s) with large amounts of gently flowing water for at least 15-20 minutes, occasionally lifting the upper and lower eyelids. If a contact lens is present, DO NOT delay flushing or attempt to remove the lens. Get medical attention immediately.

Ingestion: Have victim rinse mouth with water. Get medical attention immediately.

First Aid Comments: If exposed or concerned, see a medical professional for advice. All first aid procedures should be periodically reviewed by a medical professional familiar with the chemical and its conditions of use in the workplace.

Note to Physicians: This chemical forms carbon monoxide in the body.

What are fire hazards and extinguishing media for methylene chloride?

Flammable Properties: Can ignite if strongly heated.

Suitable Extinguishing Media: Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog. Foam manufacturers should be consulted for recommendations regarding types of foams and application rates.

Specific Hazards Arising from the Chemical: Forms corrosive chemicals on contact with water. Vapour may accumulate in hazardous amounts in low-lying areas, especially inside confined spaces, resulting in a toxicity hazard. Closed containers may rupture violently when heated, releasing contents. In a fire, the following hazardous materials may be generated: very toxic carbon monoxide, carbon dioxide; corrosive hydrogen chloride; corrosive chlorine; corrosive phosgene.

What are the stability and reactivity hazards of methylene chloride?

- **Chemical Stability:** Normally stable.
- **Conditions to Avoid:** High temperatures. (above 100°C) Open flames, sparks, static discharge, heat and other ignition sources. High energy sources, e.g. welding arcs. Hot surfaces.
- **Incompatible Materials:** Increased risk of fire and explosion on contact with: strong oxidizing agents (e.g. perchloric acid), methanol, alkali metals (e.g. sodium or potassium). Not corrosive to: aluminum alloys, stainless steel.
- **Hazardous Decomposition Products:** Prolonged contact with water may form corrosive hydrochloric acid.
- **Possibility of Hazardous Reactions:** None known.

What are unintentional release measures for methylene chloride?

Personal Precautions: Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Eliminate all ignition sources. Use grounded, explosion-proof equipment.

Methods for Containment and Clean-up: Do not touch spilled material. Stop or reduce leak if safe to do so. Ventilate the area to prevent the gas from accumulating, especially in confined spaces. Small spills or leaks: contain and soak up spill with absorbent that does not react with spilled product. Place used absorbent into suitable, covered, labelled containers for disposal. Contaminated absorbent poses the same hazard as the spilled product. Large spills or leaks: contact emergency services and manufacturer/supplier for advice.

Other Information: Contact the supplier or local fire and emergency services for help.

What handling and storage practices should be used when working with methylene chloride?

Handling: Before handling, it is important that all engineering controls are operating and that protective equipment requirements and personal hygiene measures are being followed. Only trained personnel should work with this product. In event of a spill or leak, immediately put on escape-type respirator and exit the area. Immediately report leaks, spills or failures of the safety equipment (e.g. ventilation system). Avoid generating vapours or mists. Prevent unintentional contact with incompatible chemicals. Do not use near welding operations or other high energy sources. Do not weld, cut or perform hot work on an empty container until all traces of product have been removed.

Storage: Store in an area that is: cool, dry, well-ventilated, out of direct sunlight and away from heat and ignition sources, separate from incompatible materials. Keep amount in storage to a minimum. Store in the original, labelled, shipping container. Avoid bulk storage indoors.

What is the American Conference of Governmental Industrial Hygienists (ACGIH®) recommended exposure limit for methylene chloride?

ACGIH® TLV® - TWA: 50 ppm A3 BEI® (dichloromethane)

Exposure Guideline Comments: TLV® = Threshold Limit Value. TWA = Time-Weighted Average. A3 = Animal carcinogen. BEI® = Biological Exposure Index.

Adapted from: 2022 TLVs® and BEIs® - Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices. Cincinnati: American Conference of Governmental Industrial Hygienists (ACGIH)

NOTE: In many (but not all) Canadian jurisdictions, the exposure limits are similar to the ACGIH® TLVs®. Since legislation varies by jurisdiction, contact your local jurisdiction for exact details. A list is available in the OSH Answers on Canadian Governmental Occupational Health & Safety Departments.

A list of which acts and regulations that cover exposure limits to chemical and biological agents is available on our website. Please note that while you can see the list of legislation for free, you will need a subscription to view the actual documentation.

What are the engineering controls for methylene chloride?

Engineering Controls: Do not allow the product to accumulate in the air in work or storage areas, or in confined spaces. Use a local exhaust ventilation and enclosure, if necessary, to control the amount in the air. Provide eyewash and safety shower if contact or splash hazard exists.

What Personal Protective Equipment (PPE) is needed when working with methylene chloride?

Eye/Face Protection: Wear chemical safety goggles. A face shield (with safety goggles) may also be necessary.

Skin Protection: Wear chemical protective clothing e.g. gloves, aprons, boots. Suitable materials include: Kemblok®, Silver Shield® - PE/EVAL/PE, Chemprotex® 300, ChemMAX® (3, 4 Plus), AlphaTec® (4000, EVO, VPS), Tychem® (9000, Responder® CSM, 10000, 10000 FR), Zytron® 500.

Not recommended: butyl rubber, natural rubber, neoprene rubber, nitrile rubber, polyvinylchloride – PVC, Vitron®/Butyl rubber, AlphaTec® 02-100, Saranex®, Tychem® (5000, 6000, 6000 FR), Zytron® 300.

Respiratory Protection:

NIOSH recommendations for methylene chloride concentrations in air:

At concentrations above the NIOSH REL, or where there is no REL, at any detectable concentration:
(APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode; or Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus.

The NIOSH Recommended Exposure LIMIT (REL) for methylene chloride has not been established.

APF = Assigned Protection Factor

Recommendations apply only to National Institute for Occupational Safety and Health (NIOSH) approved respirators. Refer to the NIOSH Pocket Guide to Chemical Hazards for more information.

NOTE: NIOSH has classified this substance as a potential occupational carcinogen, according to specific NIOSH criteria. This classification is reflected in these recommendations for respiratory protection, which specify that only the most reliable and protective respirators be worn at any detectable concentration. The requirements in Canadian jurisdictions may vary.

Fact sheet last revised: 2023-02-07

Disclaimer

Although every effort is made to ensure the accuracy, currency and completeness of the information, CCOHS does not guarantee, warrant, represent or undertake that the information provided is correct, accurate or current. CCOHS is not liable for any loss, claim, or demand arising directly or indirectly from any use or reliance upon the information.