

Effective Date: June 2019
REF NO.:AK19/0136/METHYLENE CHLORIDE

METHYLENE CHLORIDE

1. Chemical Product and Company Identification

Product Identification:

Methylene Chloride

Chemicals Name:

Dichloromethane

Other Trade Name:

DICHLOROMETHANE, MC, METHYLENE CHLORIDE (MATERIAL NO: 81101426), SOLVENT M

Manufacturer/Supplier:

Aik Moh Paints & Chemicals Pte Ltd
20 TUAS STREET, SINGAPORE 638457
Tel : 6863 1993 Fax : 6863 8033
Website : www.aikmoh.com.sg

2. Hazards Identification

GHS Classification

Serious eye damage/ Eye Irritation	2
Skin corrosion/ Irritation	2
Carcinogenicity	2
Specific Target Organ Toxicity- Single exposure	3

GHS Label Elements



Signal words: Warning

Physical hazards:

Hazard classification:

- H315 - Causes skin irritation
- H319 - Causes serious eye irritation
- H336 - May cause drowsiness or dizziness
- H351 - Suspected of causing cancer

Precautionary Statement(s):

Prevention

- P201 - Obtain special instructions before use.
- P202 - Do not handle until all safety precautions have been read and understood.
- P261 - Avoid breathing dust/fume/gas/mist/vapours/spray.
- P264 - Wash thoroughly after handling.
- P280 - Wear protective gloves/protective clothing/eye protection/face protection.

Response

- P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
- P312 - Call a POISON CENTER or doctor/physician if you feel unwell.
- P308 + P313 - IF exposed or concerned: Get medical advice/attention.

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P337 + P313 - If eye irritation persists: Get medical advice/attention.
Storage
P403 + P235 - Store in a well-ventilated place. Keep cool.
Disposal
P501 - Dispose of contents/container to an approved waste disposal plant.

3. Composition Information on Ingredients

This product is a substance.

Component	CAS-No	Concentration
methylene chloride	75-09-2	99.9%

4. First-Aid Measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Skin Contact: Wash off with plenty of water

Eye Contact: Immediately flush eyes with water; remove contact lenses if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Ingestion: Do not induce vomiting. Call a physician and/or transport to emergency facility immediately.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of immediate medical attention and special treatment needed

Note to physician: Maintain adequate ventilation and oxygenation of the patient. Treat with 100% oxygen. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. Because rapid absorption may occur through the lungs if aspirated and cause systemic effects, the decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. If burn is present, treat as any thermal burn, after decontamination. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Carboxyhemoglobinemia may aggravate any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anaemia. Skin contact may aggravate pre-existing dermatitis.

5. Fire Fighting Measures

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Water fog, applied gently may be used as a blanket for fire extinguishment.

Unsuitable extinguishing media: No data available

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Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Hydrogen chloride. Carbon monoxide. Carbon dioxide. Combustion products may include trace amounts of: Phosgene. Chlorine.

Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire. Although this material does not have a flash point, it can burn at room temperature. Vapors are heavier than air and may travel a long distance and accumulate in low lying areas.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. Accidental Release Measures

Personal Precautions, protective equipment and emergency procedures: Isolate area. Refer to section 7, Handling, for additional precautionary measures. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low area. Keep personnel out of confined or poorly ventilated areas. Keep upwind of spill. Ventilate area or leak or spill. Only trained and properly protected personnel must be involved in clean-up operations. Confined space entry procedures must be followed before entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Material will sink in water. Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and Cleaning up: Contain spilled material if possible.

Small spills: Collect in suitable and properly labelled containers.

Large spills: Dike area to contain spill. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Precautions for safe handling: Do not swallow. Avoid contact with eyes, skin and clothing. Avoid breathing vapour. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. Containers, even those that have been emptied can contain vapors. Do not cut, drill, grind, weld, or perform similar operations on or near empty containers. Do not enter confined spaces unless adequately ventilated. To avoid uncontrolled emissions, vent vapour from container to storage tanks. Vapours of this product are heavier than air and lethal concentrations of vapors can collect in low, confined and unventilated spaces such as tanks, pits, small rooms and even in equipment (degreasers) that is used for degreasing metal parts. Do not enter these confined spaces where vapors of this product are suspected unless special breathing apparatus is used and an observer is present for assistance. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store under cover in a dry, clean, cool, well ventilated place away from sunlight. Do not handle or store near an open flame, heat, or sources of ignition. Keep container tightly closed when not in use. Do not store in: Zinc. Aluminium. Aluminium alloys. Plastic.

8. Exposure Controls/Personal Protection

Control parameters

Exposure limits are listed below, if they exist.

Component	Regulations	Type of listing	Value/ Notation
methylene chloride	ACGIH	TWA	50 ppm
	ACGIH	TWA	BEI

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SG OEL	PEL (long term)	174 mg/m ³ 50 ppm
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Exposure controls

Engineering controls: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only in enclosed systems or with local exhaust ventilation. Exhaust systems should be designed to move the air away from the source of vapour/aerosol generation and people working at this point. Lethal concentrations may exist in areas with poor ventilation.

Individual Protection measures

Eye/Face Protection: Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin Protection

Hand Protection: Use chemical resistant gloves classified under Standard EN374: Protective gloves against chemicals and micro-organisms. Examples of preferred glove barrier materials include: Viton. Polyvinyl alcohol ("PVA"). Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Butyl rubber. When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374) is recommended. When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374) is recommended. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. For emergency response or for situations where the atmospheric level is unknown, use an approved positive pressure self-contained breathing apparatus or positive-pressure air line with auxiliary self-contained air supply. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.

9. Physical and Chemical Properties

Appearance

Physical State: Liquid

Color: Clear

Odor: Characteristic

Odor Threshold: 250 ppm Literature

pH: Not applicable

Melting Point/ range: -96.7 °C Literature

Freezing Point: -96.7 °C Literature

Boiling Point (760 mmHg): 39.8 °C Literature

Flash Point – Closed Cup None Tag Closed Cup ASTM D56

Evaporation Rate (Butyl acetate = 1) No test data available

Flammability (solid, gas): No

Explosion limit

Lower: 14 % vol Literature

Upper: 22 % vol Literature

Vapor Pressure : 355 mmHg at 20 °C Literature

Relative Vapor Density (air = 1): 2.93 Literature

Relative Density (water = 1) 1.320 at 25 °C / 25 °C Literature

Water solubility: 1.3% @ 25 °C Literature

Partition coefficient, n-octanol/water (log Pow) 1.25 Measured

Auto-ignition Temperature: 556 °C Literature

Decomposition Temperature: No test data available

Dynamic Viscosity: 0.41 mPa.s Literature

Kinematic Viscosity: 0.31 mm²/s at 25 °C Calculated

Explosive properties: Not explosive

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Oxidizing properties: No
Molecular Weight: 84.94 g/mol *Literature*
Percent volatility: 100 % *Literature*
Particle size: Not applicable to liquids

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. Stability and Reactivity

Reactivity: No data available.

Chemical Stability : Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions Polymerization will not occur.

Conditions to Avoid: Exposure to elevated temperature can cause product to decompose. Avoid open flames, welding arcs, or other high temperature sources which induce thermal decomposition. Avoid direct sunlight or ultraviolet sources.

Incompatible Materials: Avoid contact with oxidizing material. Avoid contact with: Strong bases. Water contamination may cause corrosion of metals due to formation of hydrochloric acid. Avoid contact with metals such as: Zinc powders. Aluminum powders. Magnesium powders. Potassium. Sodium. Avoid unintended contact with: Amines

Hazardous Decomposition products Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to Hydrogen chloride. Decomposition products can include trace amounts of: Chlorine. Phosgene.

11. Toxicological Information

Toxicological information appears in this section when such data is available.

Acute Toxicity

Acute oral toxicity: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

LD50, rat > 2,000 mg/kg. No deaths occurred at this concentration.

Acute dermal toxicity: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

LD50, rat > 2,000 mg/kg. No deaths occurred at this concentration.

Acute inhalation toxicity: In confined or poorly ventilated areas, vapour can readily accumulate and can cause unconsciousness and death. Vapor may cause irritation of the upper respiratory tract (nose and throat). May cause carboxyhemoglobinemia, thereby impairing the blood's ability to transport oxygen. Minimal anesthetic or narcotic effects may be seen in the range of 500 - 1000 ppm methylene chloride. Progressively higher levels over 1000 ppm may cause dizziness, drunkenness, and as low as 10,000 ppm, unconsciousness and death. These high levels may also cause cardiac arrhythmias (irregular heartbeats).

LC50, mouse, 4 h, vapor, 86 mg/l

Skin Corrosion/Irritation: Brief contact may cause moderate skin irritation with local redness. May cause more severe response on covered skin (under clothing, gloves). Prolonged contact may cause skin burns. Symptoms may include pain, severe local redness, swelling and tissue damage.

Extensive skin contact with methylene chloride, such as immersion, may cause an intense burning sensation, followed by a cold numb feeling which will subside after contact. May cause drying and flaking of the skin.

Serious eye damage/eye irritation May cause moderate eye irritation which may be slow to heal. May cause slight corneal injury. Vapor may cause eye irritation experienced as mild discomfort and redness.

Sensitization

Skin: No relevant data found.

Respiratory: No relevant data found.

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Specific Target Organ Systemic Toxicity (Single Exposure): May cause drowsiness or dizziness.

Route of Exposure: Inhalation

Target Organ: Central nervous system.

Specific Target Organ Systemic Toxicity (Repeated Exposure) In animals, effects have been reported on the following organs: Kidney. Liver. Blood. May cause carboxyhemoglobinemia, thereby impairing the blood's ability to transport oxygen.

Carcinogenicity: Methylene chloride has been shown to increase the incidence of malignant tumors in mice and benign tumors in rats. Other animal studies on methylene chloride alone, as well as several human epidemiology studies, failed to show a tumorigenic response. Methylene chloride is not believed to pose a measurable carcinogenic risk to humans when handled as recommended. Studies have shown that tumors observed in mice are unique to that species. Studies in workers with combined exposure to methylene chloride and 1,2-dichloropropane have reported increased incidences of cholangiocarcinoma.

Teratogenicity: Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause birth defects in laboratory animals.

Reproductive Toxicity: In animal studies, did not interfere with reproduction.

Mutagenicity: In vitro genic toxicity studies were negative in some cases and positive in other cases, Negative or equivocal results have been obtained in genetic toxicity tests with methylene chloride using mammalian cells or animals. This is consistent with the lack of interaction with DNA in rats and hamsters. Although results of Ames bacterial tests have generally been positive, overall the data suggest that genotoxic potential does not appear to be a significant factor in the toxicity of methylene chloride.

Aspiration Hazard: Aspiration into the lungs may occur during ingestion or vomiting, resulting in rapid absorption and injury to other body systems.

12. Ecological Information

Ecotoxicological information on this product and its components appear in this section when such data is available.

Ecotoxicity

Acute toxicity to fish Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species).
LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 193 mg/l

Acute toxicity to aquatic invertebrate LC50, Daphnia magna (Water flea), static test, 27 mg/l, OECD Test Guideline 202 or Equivalent.

Acute toxicity to algae/aquatic plants Ebc50, Pseudokirchneriella subcapitata (green algae), 96 Hour, Biomass, > 662 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria EC50, activated sludge, static test, 40 min, 2,590 mg/l, OECD 209 Test

Chronic aquatic toxicity

Chronic toxicity to fish NOEC, Pimephales promelas (fathead minnow), flow-through test, 28d, growth, 83 mg/l

Persistence and Degradability

Biodegradability: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

10 day Window: Pass

Biodegradation: 68%

Exposure time: 28 d

Method: OECD Test Guideline 301D or Equivalent

10 day Window: Not applicable

Biodegradation: 66%

Exposure time: 50 Hour

Method: Simulation study

Theoretical Oxygen Demand: 0.38 mg/mg

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Photodegradation

Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Atmospheric half-life: 79 - 110 d
Method: Estimated

Bioaccumulative potential

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or log Pow < 3).
Partition coefficient, n-octanol/water (log Pow): 1.25 at 20 °C Measured
Bioconcentration Factor (BCF): 2 - 40 Fish. Measured

Mobility in soil

Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): 46.8 Estimated.

Results of PBT and vPvB assessment: This substance is not considered to be persistent, bioaccumulating and toxic (PBT). This substance is not considered to be very persistent and very bioaccumulating (vPvB).

Other adverse effects: This substance is not on the Montreal Protocol list of substances that deplete the ozone layer.

13. Disposal Considerations

Disposal methods

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

Contaminated packaging: Containers, even those that have been emptied, can contain vapors. Do not cut, drill, weld, or perform similar operations on or near empty containers.

This product when disposed of in its unused and uncontaminated state should be treated as a hazardous waste.

14. Transport Information

Classification for ROAD and Rail transport:

Proper Shipping Name: DICHLOROMETHANE
UD Number: UN 1593
Class: 6.1
Packing Group: III

Classification for SEA transport (IMO-IMDG)

Proper Shipping Name: DICHLOROMETHANE
UD Number: UN 1593
Class: 6.1
Packing Group: III
Marine Pollutant: No

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code: Consult IMO regulations before transporting ocean bulk

Classification of AIR transport (IATA/ ICAO)

Proper Shipping Name: Dichloromethane
UD Number: UN 1593
Class: 6.1

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Packing Group: III

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

Workplace Classification

This product is classified as hazardous according to Singapore Standards, Act and Regulations.

The following statutes, regulations and standards have the related prescribes on chemicals in terms of safe use, storage, transportation, loading and unloading, classification and symbol etc.

Workplace Safety and Health Act & Workplace Safety and Health (General Provisions) Regulations Environmental Protection and Management Act and Environmental Protection and Management (Hazardous Substances) Regulations

Chemical Weapons Prohibition Act

Fire Safety Act and Fire Safety (Petroleum and Flammable Materials) Regulations

16. Other Information

Legend

ACGIH: USA, ACGIH Threshold Limit Values (TLV)

BEI: Biological Exposure Indices

PEL (Long term) : Permissible Exposure Level (PEL) Long Term

SG OEL: Singapore Workplace Safety and Health Act - First Schedule Permissible Exposure Limits to Toxic Substances

TWA: 8-hour, Time Weighted Average

MSDS Distribution

The information in this document should be made available to all who may handle the product

Disclaimer

This information is based on our current knowledge and is intended to describe the product for the only. It should not therefore be construed as guaranteeing any specific property of the product.