

**METHANOL****PRODUCT IDENTIFICATION****Chemical Name and Synonyms:**

Methanol; Wood alcohol; Methyl hydrate; Methyl alcohol

**Chemical Family:**

Saturated primary aliphatic alcohol

**Chemical Formula:**

CH<sub>3</sub>OH

**Product Use:**

Laboratory solvent

**Manufacturer's Name and Address:**

Caledon Laboratories Ltd.  
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**HAZARDOUS INGREDIENTS OF MATERIALS**

Ingredients	%	TLV Units	CAS No.
Methanol	99	(TWA) 200 ppm	67-56-1

**PHYSICAL DATA****Physical State:**

Liquid

**Odour and Appearance:**

Clear, colourless, mobile liquid with mild, characteristic, alcohol odour

**Odour Threshold (ppm):**

4.2-5,000 ppm (irritation); 2000-8800 ppm (recognition). Poor warning qualities, odour threshold is much greater than TLV, and reports vary widely.

**Vapour Pressure (mm Hg):**

96 mm Hg at 20°C

**Vapour Density (Air = 1):**

1.11

**Evaporation Rate (n-Butyl acetate = 1):**

4.1

**Boiling Point (degrees C):**

64.6°C

**Freezing Point (degrees C):**

-97.8°C

**pH:**

Not applicable

**Specific Gravity:**

0.7921 @ 20°C

**Coefficient of Water/Oil distribution:**

LogP (oct) = -0.82

**SHIPPING DESCRIPTION****UN:**

1230

**T.D.G. Class:**

3 (6.1)

**Pkg. Group:**

II

**REACTIVITY DATA****Chemical Stability:**

Stable

**Incompatibility with other substances:**

Violent reactions or explosions can occur with magnesium, bromine, sodium hypochlorite, Lewis or mineral acids,

hydrogen peroxide and other strong oxidizers, chlorides, metals, beryllium hydride, cyanuric chloride, alkylaluminum solutions, tetraphosphorus hexaoxide, isocyanates, diethyl zinc, acetyl bromide. Forms shock-sensitive or explosive compounds with perchloric acid or metal perchlorates. Mixtures with powdered metals can detonate. May be corrosive to lead, aluminum. Attacks some plastics, rubbers, coatings.

**Reactivity:**

Avoid high temperatures, sparks, open flames, all sources of ignition, all incompatible materials, generation of mist.

**Hazardous Decomposition Products:**

CO<sub>x</sub>

**FIRE AND EXPLOSION DATA****Flammability:**

Flammable liquid and vapour. Solutions of greater than 20% (aqueous) can be ignited. Forms explosive mixtures with air. Vapour can travel to distant sources of ignition and flash back. Liquid floats on water and may travel to distant locations, spreading fire.

**Extinguishing Media:**

Dry chemical, carbon dioxide, alcohol-resistant foam, water spray or fog. Water spray or fog may be used to cool containers, disperse vapours, flush spill away from ignition source, or dilute spill to non-flammable mixture. Fight fire from upwind, from a safe distance. Firefighters must wear NIOSH/OSHA approved positive-pressure, full face-piece self-contained breathing apparatus, and full chemical splash suit (Bunker Gear will not be adequate). Containers may explode in heat of fire; withdraw immediately in case of rising sound from vent or discoloration of tank.

**Flash Point (Method Used):**

11°C (TCC)

**Autoignition Temperature:**

385°C

**Upper Flammable Limit (% by volume):**

36

**Lower Flammable Limit (% by volume):**

5.5

**Hazardous Combustion Products:**

CO<sub>x</sub>

**Sensitivity to Impact:**

None identified

**Sensitivity to Static discharge:**

Electrical conductivity is high; therefore not likely to accumulate static charge by flow or agitation. However, one source states that anhydrous methanol has low electrical conductivity and could accumulate charge. Mixtures of vapour in air may be ignited by static discharge of sufficient energy.

**TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD<sub>50</sub>:**

(oral, rat) 5,628 mg/kg; (dermal, monkey) 1.6 g/kg (low toxicity to animals both orally and by skin contact)

**LC<sub>50</sub>:**

(rat) 64,000 ppm/4 h (practically non-toxic to rats)

**Effects of Acute Exposure to Product:****Inhaled:**

Toxic. Causes irritation of eyes, nose, throat and respiratory tract. May cause headache, drowsiness, giddiness, loss of consciousness, digestive and visual disturbances. May cause blindness, CNS depression, and death, due to respiratory

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depression. Note that odour threshold is several times higher than the TLV-TWA. Depending on severity of exposure and promptness of treatment, survivors may recover completely or be left with visual disturbances or blindness, CNS effects.

## **In contact with skin:**

Direct contact with vapour, mist or liquid may cause defatting, drying and cracking of skin. May be absorbed through intact skin, with systemic effects such as CNS depression and blindness, if exposure is severe.

## **In contact with eyes:**

Liquid irritates, causing conjunctivitis, redness and pain.

## **Ingested:**

Poisonous. Causes irritation of mucous membranes of mouth and throat. May cause CNS depression and blindness. Severe overexposure may cause metabolic acidosis, unconsciousness and death. Onset of symptoms may be delayed 18 to 24 hours after exposure. Ingestion damages the kidneys, liver, heart and other organs. 60 to 200 mL is considered fatal for humans; as little as 10 mL has caused blindness.

## **Effects of Chronic Exposure to Product:**

Prolonged or repeated exposure may cause systemic poisoning, brain disorders, impaired vision or blindness. May adversely affect persons with chronic disease of the central nervous system, skin, gastrointestinal tract, and/or eyes.

Prolonged or repeated skin exposure may cause dermatitis.

## **Carcinogenicity:**

Not listed as a carcinogen by NTP, OSHA

## **Teratogenicity:**

May cause teratogenic/embryotoxic effects based on studies with laboratory animals, at dose levels non-toxic to mother (RTECS No. PC 1400000).

## **Reproductive Effects:**

Reported to cause birth defects in rats exposed to 20,000 ppm.

## **Mutagenicity:**

Limited evidence in vitro (mouse). No in vivo information available

## **Synergistic Products:**

Alcohols may interact synergistically with chlorinated solvents (e.g. carbon tetrachloride, chloroform, bromotrichloromethane), dichlorocarbamates (e.g. disulphiram), dimethylnitrosamine and thiocetamide)

## **PREVENTIVE MEASURES**

### **Engineering Controls:**

Local, non-sparking, grounded exhaust ventilation system required.

### **Respiratory Protection:**

From 200 to 2000 ppm: NIOSH/OSHA approved supplied-air respirator, or continuous flow positive-pressure self-contained breathing apparatus. To 5000 ppm: continuous flow or pressure demand supplied-air respirator. To 6000 ppm: full face-piece continuous flow or pressure demand supplied-air respirator. For higher or unknown concentrations, as in fire or spill conditions: positive-pressure, full face-piece self-contained breathing apparatus, or positive-pressure, full face-piece supplied-air respirator with an auxiliary positive-pressure, self-contained breathing apparatus escape system.

### **Eye Protection:**

Chemical safety goggles and/or face shield.

### **Skin Protection:**

Butyl rubber, Viton™, Viton™/Butyl rubber, Barrier (PE/PA/PE), Silver Shield/4H™ (polyethylene /ethylene vinyl alcohol), Responder™, Trelchem™ HPS, Tychem™ SL, Tychem™ TK gloves. Other impermeable protective clothing, coveralls, apron, boots, etc., sufficient to prevent contact.

Tychem(TM) SL, Tychem(TM) TK.

### **Other Personal Protective Equipment:**

Safety shower and eye-wash fountain in work area.

### **Leak and Spill Procedure:**

Evacuate area. Eliminate all sources of ignition. Cleanup personnel must be thoroughly trained in the handling of hazardous chemicals and their safe use, and must wear protective equipment and clothing sufficient to prevent inhalation or contact with skin and eyes. Stop or reduce leak if safe to do so. Surround and cover the spilled material with inert absorbant. Do not touch spilled material. Do not breathe mist or vapours. Prevent from entering sewers or waterways. Collect contaminated material and place in suitable, labelled containers for disposal. Wash area of spill thoroughly with copious amounts of water.

### **Waste Disposal:**

Follow all federal, provincial and local regulations for disposal.

### **Handling Procedures and Equipment:**

TOXIC, FLAMMABLE, REPRODUCTIVE HAZARD. Personnel must be thoroughly trained in its hazards and its safe use, and must use appropriate protective equipment and clothing. Avoid any contact with eyes, skin and clothing. Avoid inhalation of mists or vapours. Keep away from heat, sparks, flame and all sources of ignition. Bond or ground during liquid transfer. Use non-sparking tools. Use the smallest amount possible for the purpose, in an area with adequate ventilation. Keep work area clean and free of extraneous, particularly flammable, materials. Treat empty containers with caution; they may contain hazardous residues.

### **Storage Requirements:**

Store in suitable, labelled containers, in a cool, dry, well-ventilated area, out of direct sunlight and away from incompatible materials. Storage facilities should be made of fire-resistant materials. Provide raised sills and trenches to drain to a safe area. Do not expose sealed containers to elevated temperatures. Keep away from heat, sparks, flames, and all sources of ignition. Protect from damage, and inspect frequently for signs of leaking. Treat empty containers with caution, as they may contain hazardous residues.

## **FIRST AID MEASURES**

### **Specific Measures:**

#### **Eyes:**

Immediately flush eyes with gently running water for at least twenty (20) minutes, holding eyelids open while flushing, or until no trace of chemical remains. Take care not to flush contaminated water into unaffected eye. Wear protective gloves to avoid contact during first aid procedures. Obtain medical attention immediately.

#### **Skin:**

Remove contaminated clothing (including rings, watches, belts, and shoes). Immediately flush exposed area with large amounts of warm running water for at least fifteen (15) minutes. Wear gloves to avoid contact. Obtain medical attention immediately. Decontaminate clothing before reuse, or discard.

#### **Inhalation:**

IMMEDIATELY remove to fresh air (caution must be used by rescuers to avoid exposure to contaminating fumes). Give oxygen and get medical attention for any breathing difficulty. If breathing has STOPPED give artificial respiration. If breathing AND pulse are ABSENT give CPR. IMMEDIATELY OBTAIN MEDICAL ATTENTION. Stay with casualty until medical assistance is reached.

#### **Ingestion:**

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*DO NOT INDUCE VOMITING. Danger of aspiration with emesis. If casualty is alert and NOT convulsing, rinse out mouth with water, and give 2 to 4 glasses of water to drink to dilute. Get medical attention IMMEDIATELY. If spontaneous vomiting occurs have casualty lean forward with head down to avoid breathing in of vomitus.*

## **REFERENCES USED**

*CCINFO disc: Cheminfo*

*Royal Society of Chemistry: Chemical Safety Data Sheets, Vol. 1, 1992*

*Sax, Lewis: Hawley's Condensed Chemical Dictionary, 11th ed., 1987*

*Sax: Dangerous Properties of Industrial Materials, 5th ed., 1979*

*Bretherick: Hazards in the Chemical Laboratory, 3rd ed., 1981*

*Suppliers' Material Safety Data Sheets*

## **ADDITIONAL INFORMATION**

### **Date Issued:**

*November 1, 1988*

### **Revision:**

*May 2012*

### **MSDS:**

*6700-1, 6700-3, 6700-4, 6700-30, 6701-2, 6701-7, 6702-1, 6706-1, 6708-2, 6750-1, CAL 1344*

### **Proposed WHMIS Designation:**

*B2; D1B; D2A; D2B*

*Prepared by: Caledon Laboratories Ltd. (905)*

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