

**MATERIAL SAFETY DATA SHEET****CHLOROFORM**

PRODUCT CODE NUMBER(S): 3000-1, 3000-3, 3000-4, 3001-2, 3001-7, 3004-2, 3004-7, 3009-1, CAL 1337

**PRODUCT IDENTIFICATION****Chemical Name and Synonyms:** Chloroform, Trichloromethane**Chemical Family:** Chlorinated hydrocarbon**Chemical Formula:** CHCl<sub>3</sub>**Product Use:** Laboratory solvent**Manufacturer's Name and Address:**Caledon Laboratories Ltd.  
40 Armstrong Avenue  
Georgetown, Ontario L7G 4R9**Telephone No:** (905) 877-0101**Fax No:** (905) 877-6666**Emergency Telephone No.:** CANUTEC (613) 996-6666**HAZARDOUS INGREDIENTS OF MATERIALS**

Ingredients	%	TLV Units	CAS No.
Chloroform	99+	10 ppm	67-66-3
Ethanol (preservative)	~1.0	1000 ppm	64-17-5
OR			
1-Pentene (preservative)	<0.02	Not available	109-67-1

**PHYSICAL DATA****Physical State:** Liquid**Odour and Appearance:** Clear, colourless liquid with ether-like odour**Odour Threshold (ppm):** ~200 ppm (detection). Wide range of values reported. Poor warning properties, odour threshold well above TLV.**Vapour Pressure (mm Hg):** 159 mm Hg @ 20°C**Vapour Density (Air = 1):** 4.12**Evaporation Rate(Bu ac=1):** 7.6**Boiling Point (°C):** 61.2°C**Freezing Point (°C):** -63.5°C**pH:** Not applicable**Specific Gravity:** 1.489 @ 20°C**Coefficient of Water/Oil distribution:** LogP(oct)=1.97**SHIPPING DESCRIPTION****UN:** 1888**T.D.G. Class:** 6.1**Pkg. Group:** III**REACTIVITY DATA****Chemical Stability:** Slowly decomposes, in the presence of light or air, forming toxic, corrosive gases.**Incompatibility with other substances:** May react violently or explosively with strong bases, strong oxidizing agents, ketones, alkali metals, such as lithium or potassium, reactive metals, such as aluminum or magnesium, acetone, disilane, dinitrogen tetroxide, fluorine, nitromethane. Ignition occurs on contact with potassium tert-butoxide. May form detonatable mixtures with alkali metals or nitromethane. Dry,

stabilized chloroform is not corrosive to most metals, but if wet and unstabilized, attacks many metals, including aluminum, zinc, some stainless steels.

**Reactivity:** Avoid open flames, excess water, hot surfaces, high heat, direct sunlight, electric arcs, sparks and other sources of ignition which can cause thermal decomposition. Avoid generation of mist.**Hazardous Decomposition Products:** At high temperatures, gives off hydrogen chloride gas, phosgene, chlorine.**FIRE AND EXPLOSION DATA****Flammability:** Non combustible. Will not burn. Decomposes at high temperatures releasing toxic gases.**Extinguishing Media:** Carbon dioxide, dry chemicals or water spray. Use water as spray or fog, in flooding quantities, to cool containers, disperse vapours, flush material away from fire. Fight fire from upwind, from a safe distance. Firefighters must wear full-body encapsulating chemical resistant suit and full face-piece, positive-pressure self-contained breathing apparatus. Closed containers may explode in heat of fire; withdraw immediately in case of rising sound from venting device, or discoloration in container.**Flash Point (Method Used):** Non applicable**Autoignition Temperature:** >1000°C (chemicals released during thermal decomposition)**Upper Flammable Limit (% by volume):** Not applicable**Lower Flammable Limit (% by volume):** Not applicable**Hazardous Combustion Products:** Phosgene, chlorine, hydrogen chloride, CO<sub>x</sub>**Sensitivity to Impact:** None**Sensitivity to Static discharge:** None**TOXICOLOGICAL PROPERTIES AND HEALTH DATA****Toxicological Data:****LD<sub>50</sub>:** (oral, rat) 908 mg/kg; (oral, young rat) 450 mg/kg; (oral, male mouse) 36 mg/kg; dermal, rabbit >29 g/kg  
**LC<sub>50</sub>:** (rat) 2,265 ppm/4h**Effects of Acute Exposure to Product:**

Chloroform toxicity may be increased by exposure with alcohol, steroids, polybrominated biphenyls, acetone, or chlordecone. Women who are pregnant or expect to become pregnant are advised to avoid exposure to this product. Persons with a history of liver disease or alcoholism should not be exposed to this product.

**Inhaled:** Readily forms vapour posing inhalation hazard. Concentrations around 1,000 ppm produce headache, dizziness, shortness of breath, and fatigue after a few minutes. Concentrations around 4,000 ppm cause nausea and vomiting. 10,000 ppm causes loss of feeling; 14,000 to 16,000 causes severe narcosis with stupor and unconsciousness. Concentrations of 15,000 to 18,000 can be life-threatening, causing respiratory or heart failure. Delayed effects include damage to heart, liver and kidneys.**In contact with skin:** Mildly to severely irritating to skin. Produces a burning sensation. May be absorbed through skin with systemic effects as in "Inhaled".**In contact with eyes:** No human information available. Animal studies indicate liquid causes severe irritation, with

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pain, lacrimation, general inflammation, temporary corneal injury. Vapours cause temporary pain, irritation, tearing.

**Ingested:** Toxic and irritating to gastrointestinal tract, causing vomiting, irregular heart beat, CNS effects, liver and kidney damage. May be fatal. Aspiration, which can occur during ingestion or vomiting, can cause severe, life-threatening chemical pneumonitis or pulmonary edema.

#### Effects of Chronic Exposure to Product:

Chronic overexposure may cause headache, mental confusion, depression, fatigue, loss of appetite, loss of balance, visual disturbances, liver and kidney damage. Prolonged skin contact can cause dermatitis.

**Carcinogenicity:** Suspected carcinogen (ACGIH A3); confirmed animal carcinogen (IARC, 2B, NTP), human evidence insufficient.

**Teratogenicity:** Causes fetal abnormalities or death at levels toxic to the mothers in animal studies.

**Reproductive Effects:** Insufficient evidence.

**Mutagenicity:** Considered to be mutagenic, based on animal information. Studies on germ and somatic cells of live animals show mutagenicity.

**Synergistic Products:** Toxicity is increased by alcohols and phenobarbital. Liver effects are increased by corn oil.

#### PREVENTIVE MEASURES

**Engineering Controls:** Exhaust ventilation, separate from other ventilation systems.

**Respiratory Protection:** Fumehood. Above 2 ppm, or any detectable or unknown concentration, for tank or confined space entry, for fire or spill conditions, NIOSH approved full face-piece, positive-pressure self-contained breathing apparatus, or positive-pressure full face-piece supplied-air respirator with auxiliary positive-pressure self-contained breathing apparatus.

**Eye Protection:** Chemical safety goggles, face shield.

**Skin Protection:** PVA, Viton™, Barricade™, 4H, Responder, Trelchem HPS™, Tychem™ BR/LV, Tychem TK gloves. Other impervious clothing, apron, coveralls, boots, etc., sufficient to prevent any contact.

**Other Personal Protective Equipment:** Safety shower and eyewash fountain in the work area.

**Leak and Spill Procedure:** Evacuate area, provide maximum ventilation. Eliminate sources of heat and ignition. Cleanup personnel must be thoroughly trained in the hazards of this material, and must wear protective equipment and clothing sufficient to prevent inhalation of vapours or mists and contact with skin, eyes, and clothing. Contain spill and collect using inert absorbent material (not combustibles such as sawdust). Do not allow to enter sewers or waterways. After collection of contaminated absorbent is complete, wash site of spill thoroughly with plenty of water. Contaminated absorbent may pose the same hazards as the chemical; treat with caution.

**Waste Disposal:** Follow all federal, provincial and local regulations.

**Handling Procedures and Equipment:** VERY TOXIC, POSSIBLE CARCINOGEN AND MUTAGEN, IRRITANT. Use only with adequate protective equipment and clothing. Workers must be thoroughly trained in the hazards of this chemical and its safe use. Avoid all contact with eyes, skin and clothing. Avoid inhalation of vapours or mists. Keep away from heat and ignition sources. Prevent water or moist air from entering storage containers. Vapours are heavier than air and will collect in low areas. Do not enter low areas, confined spaces without taking proper safety precautions, never alone, always with a lifeline, and with a

supply of fresh air. Use the smallest amount possible for the purpose, in a designated area with adequate ventilation. Do not use aluminum equipment and/or storage containers. Avoid exposure to strong UV light, hot surfaces, flames, oxygen to prevent generation of toxic products. Treat empty containers with caution, they may contain hazardous residues.

**Storage Requirements:** Store in suitable, labelled containers, in a cool, well-ventilated area away from heat, sparks, open flame, and incompatible materials. Do not store in aluminum containers. Keep containers tightly closed when not in use and when empty. Protect from damage. Inspect frequently for leaks. Storage area should have raised sills or ramps and a trench which drains to a safe location. DO not use toches, open flames, or electric arcs on empty or full containers.

#### FIRST AID MEASURES

##### Specific Measures:

**Eyes:** IMMEDIATELY flush eyes with warm gently running water, holding eyelids open during flushing, for at least twenty to thirty (20-30) minutes. Wear protective gloves to avoid contact with chemical. Take care not to flush contaminated water into unaffected eye. Obtain medical advice immediately (flushing may be continued while casualty is transported to medical facility).

**Skin:** Wear protective gloves to avoid contact with chemical. Under running water, remove contaminated clothing (including rings, watches, belts, and shoes). IMMEDIATELY flush exposed area with large amounts of running water for twenty to thirty (20-30) minutes. Get medical attention immediately. Decontaminate clothing before reuse, or discard.

**Inhalation:** IMMEDIATELY remove casualty to fresh air (caution must be used by rescuers to avoid exposure to contaminating fumes). Give oxygen for 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:** DO NOT INDUCE VOMITING. Danger of aspiration with vomiting. If casualty is alert and not convulsing, rinse out mouth with water. Give 1 to 2 glasses of water to dilute material. Immediately get medical attention. If spontaneous vomiting occurs, have casualty lean forward with head down to avoid breathing in of vomitus.

#### REFERENCES USED

CCINFO disc:

Budavari: The Merck Index, 12th ed., 1997

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

Sax: Dangerous Properties of Industrial Materials, 1979  
Suppliers' Material Safety Data Sheets

#### ADDITIONAL INFORMATION

**Date Issued:** November 1, 1988

**Revision:** December 2010

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**Proposed WHMIS Designation:** D1B; D2A: D2B

Prepared by: Caledon Laboratories Ltd. (905) 877-0101  
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