

MATERIAL SAFETY DATA SHEET

A Responsible Care® Company

4. FIRST AID INFORMATION

Skin	Remove contaminated clothing; wash under shower with soap and water for 15 minutes. Seek medical attention if irritation occurs.
Eye	Flush immediately with gently running water for a minimum of 15 minutes, ensuring all surfaces and crevices are flushed by lifting lower and upper lids. Obtain medical attention.
Inhalation	Remove to fresh air, restore or assist breathing if necessary, obtain medical attention immediately.
Ingestion	Swallowing methanol is life threatening. Onset of symptoms may be delayed for 18 to 24 hours after ingestion. If conscious and medical aid is not immediately available, do not induce vomiting. Transport to medical attention.

5. FIRE AND EXPLOSION HAZARD

Flammable/Combustible (yes/no)	Yes
If yes, under what conditions?	In the presence of an ignition source.
Extinguishing Media	Small fires: Dry Chemical, CO ₂ , water spray. Large Fires: Water spray, AFFF(R) (Aqueous Film Forming Foam (alcohol resistant)) type with either a 3% or 6% foam proportioning system.
Special Firefighting Instructions	Methanol burns with a clean clear flame that is almost invisible in daylight. Stay upwind. Isolate and restrict area access. Concentrations of greater than 25% methanol in water can be ignited. Use fine water spray or fog to control fire spread and cool adjacent structures or containers. Contain fire control water for later disposal. Fire fighters must wear full face, positive pressure, self-contained breathing apparatus or airline and appropriate protective clothing. Protective fire fighting structural clothing is not effective protection from methanol. Do not walk through spilled product.
Flashpoint and Method	11°C (52°F)(TCC) 15.6°C (60°F) (TOC)
Lower Explosive Level (% volume)	6 %
Upper Explosive Level (% volume)	36 % (NFPA 1978) 36.5% (Ullmann 1975)
Auto Ignition Temp.	385°C (NFPA 1978) 470°C (Kirk-Othmer 1981; Ullmann 1975)
Sensitivity to Static Discharge	Low
Hazardous Combustion Products	Toxic gases and vapours; oxides of carbon and formaldehyde.

6. REACTIVITY DATA

Chemically Stable (yes/no)	Yes
If no, under what conditions?	Not applicable
Incompatible with other substances	Yes
If yes, which ones?	Strong oxidizers, strong acids, strong bases. May be corrosive to lead and aluminium.

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Conditions of Reactivity Presence of incompatible materials and ignition sources
Hazardous Decomposition Products Formaldehyde, carbon dioxide and carbon monoxide.

7. SPILL AND LEAK RESPONSE

Spill or Leak Response Flammable liquid. Release can cause an immediate fire/explosion hazard. Eliminate all ignition sources, stop leak and use absorbent materials. If necessary, contain spill by diking. Fluorocarbon alcohol resistant foams may be applied to spill to diminish vapour and fire hazard. Maximize methanol recovery for recycling or reuse. Collect liquid with explosion proof pumps. For small spills, collect with a non-combustible sorbent. Recover methanol or dilute with water to reduce fire hazard. Prevent spilled methanol from entering sewers, confined spaces, drains, or waterways. Restrict access to unprotected personnel. Full-face, positive pressure self-contained breathing apparatus or airline and protective clothing must be worn. Protective fire fighting structural clothing is not effective protection from methanol. Do not walk through spilled product as it may be on fire and not visible.

Waste Disposal Incineration is the recommended disposal method. Biological treatment may be used on dilute aqueous waste methanol. Methanol wastes are not suitable for underground injection. Waste materials must be disposed of in accordance with your municipal, state, provincial and federal regulations. Contact the proper authorities for specific instructions or contact the 24 HOUR EMERGENCY NUMBER: 1-800-424-9300.

Degradability/Aquatic Toxicity Biodegrades easily in water. Methanol in fresh or salt water may have serious effects on aquatic life. A study on methanol's toxic effects on sewage sludge bacteria reported little effect on digestion at 0.1% while 0.5% methanol retarded digestion. Methanol will be broken down to carbon dioxide and water.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT

Engineering Controls In confined areas, local and general ventilation should be provided to maintain airborne concentrations below permissible exposure limits. Ventilation systems must be designed according to approved engineering standards.

Gloves Butyl and nitrile rubbers are recommended. Check with glove manufacturer.

Respiratory NIOSH approved supplied air respirator when airborne concentrations exceed exposure limits.

Eye Face shield and chemical splash goggles when transferring is taking place.
Footwear Chemical resistant.

Clothing Wear chemical resistant pants and jackets, preferably butyl or nitrile rubber. Check with manufacturer.

NOTE: PPE must not be considered a long-term solution to exposure control. PPE usage must be accompanied by employer programs to properly select, maintain, clean, fit and use. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers to ensure adequate protection.

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9. STORAGE AND HANDLING REQUIREMENTS

Storage	Store in totally enclosed equipment, designed to avoid ignition and human contact. Tanks must be grounded and vented and should have vapour emission controls. Tanks must be diked. Avoid storage with incompatible materials. Anhydrous methanol is non-corrosive to most metals at ambient temperatures except lead and magnesium. However coatings of copper (or copper alloys), zinc (including galvanized steel) or aluminium are unsuitable for storage as they are attacked slowly. Storage tanks of welded construction are normally satisfactory. They should be designed and built in conformance with good engineering practice for the material being used. Mild steel is the recommended construction material. Tanks built with copper alloys (including coatings of copper), zinc (including galvanized steel), aluminium or plastics are not suitable.
Handling	No smoking or open flame in storage, use or handling areas. Use explosion proof electrical equipment. Ensure proper electrical grounding procedures are in place.
Shipping Information	All shipments of methanol must be properly classified, described, packaged, marked and labelled to conform with regulations set by Transport Canada, Transportation of Dangerous Goods Regulations and U.S. Department of Transport (DOT), Bureau of Explosives and Hazardous Materials Regulations.

10. PHYSICAL DATA

Physical State	Liquid
Odour	Slight alcohol odour
Odour Threshold	2000 ppm, (irritation at 1000 ppm, poor olfactory warning properties)
Appearance	Clear, colourless
Specific Gravity	0.792 (H ₂ O = 1)
Freezing Point	-97.8°C (-144°F)
Boiling Point	64.5°C (148°F) at 760 mm Hg
Vapour Pressure	96 mm Hg at 20°C (68°F)
Vapour Density (air=1)	1.105 at 15°C (59°F)
Evaporation Rate (n-Butyl acetate=1)	2.1
Molecular Weight	32.04
Volatile, Percent by Volume	100%
Solubility in Water at 20°C	Soluble
pH	Not applicable
Water/Oil Distribution Coefficient	Readily soluble in water, separates from oil.

MATERIAL SAFETY DATA SHEET**11. REGULATORY INFORMATION**

Transportation	Canadian TDG: Methanol, Flammable Liquid, 3 (6.1), UN 1230, PG II
WHMIS - Canada	USA DOT: Methyl Alcohol (RQ 5000/2270), Flammable Liquid, UN 1230 PG II B2, D1A
OSHA - USA	Hazardous according to 29 CFR 1910.1200
EPA	Hazardous according to the Clean Water Act 40 CFR 116-117
	Emergency Planning and Notification - 40 CFR 355 Appendices A and B
	SARA Title III Section 131, Specific Toxic Chemical Listings - 40 CFR 372
	CERCLA Hazardous Substances List; Designation, Reportable Quantities, Notification - 40 CFR 302
Other	OSHA 29 CFR 1910.1200: Hazardous
	NFPA Rating: Health = 1, Fire = 3, Reactivity = 0

12. SUPPLEMENTAL INFORMATION

NOTE TO PHYSICIAN: Acute exposure to methanol, either through ingestion or breathing high airborne concentrations can result in symptoms appearing between 40 minutes and 72 hours after exposure. Symptoms and signs are usually limited to CNS, eyes and gastrointestinal tract. Because of the initial CNS's effects of headache, vertigo, lethargy and confusion, there may be an impression of ethanol intoxication. Blurred vision, decreased acuity and photophobia are common complaints. Treatment with ipecac or lavage is indicated in any patient presenting within two hours of ingestion. A profound metabolic acidosis occurs in severe poisoning and serum bicarbonate levels are a more accurate measure of severity than serum methanol levels. Treatment protocols are available from most major hospitals and early collaboration with appropriate hospitals is recommended.

13. PREPARATION INFORMATION

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References Used	American Conference of Governmental Industrial Hygienists, Documentation of Threshold Limit Values, 1994-1995 Hazardous Substances Data Base, 1996 Microtech; #1.93 Revised 1995.05.2 Hazard Management Data Base, 1996 Microtech, Revised 1995.05.2 RTECS, 1995 NIOSH Pocket Guide, 1995 Reproductive Effects Data Base; 1996 Microtech, Revised 1995.05.2 Medical Management Data Base; 1996 Microtech, Revised 1995.05.2 Dangerous Goods Initial Emergency Response Guide 1992, Transport Canada

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