

# Material Safety Data for: Methyl Alcohol / Methanol

## 1. PRODUCT IDENTIFICATION

<b>Name</b>	methanol
<b>Synonyms</b>	methyl alcohol, methyl hydrate, wood alcohol, methyl hydroxide
<b>CAS#</b>	67-56-1
<b>Europe EC#</b>	200-659-6
<b>Product Uses</b>	solvent, antifreeze (gasoline), manufacture of formaldehyde, <i>tert</i> -butyl ether & others

## 2. INGREDIENTS

	%	TWAEV / TLV mg/m <sup>3</sup>	LD <sub>50</sub> ORAL	(mg/kg) SKIN	LC <sub>50</sub> ppm INHALATION
Methanol	100%	200 / 260 (skin)	5630	15,800	62,000

## 3. (a) HAZARDS SUMMARY

**Hazards, Quick Guide:** flammable liquid, heavy vapour may travel, distant ignition and flashback are possible, *burns with nearly invisible flame*; irritating to skin and eyes, nervous system depressant, *absorption may cause blindness*, probable reproductive toxin

### Canada – WHMIS

Key:

### B 2, D 1B, D 2A

*B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C*

*D 1 – Immediately Toxic, D 2 – Chronic Toxicity*

*C – Oxidising Substance, E – Corrosive*

### U.S.A. – HMIS

Key:

### Health – 2, Fire – 3, Reactivity – 0

*0=minimal, 1=slight, 2=moderate, 3=serious, 4=severe*

## 3. (b) HAZARDS – TOXICITY

### Effects, Acute Exposure

Skin Contact	may irritate, but exposure would have to be prolonged
Skin Absorption	yes; normally, no toxic effects can occur by this route – exposure by some other route would have to occur at the same time; <i>one case of toxicity by skin exposure slon has been reported</i>
Eye Contact	may irritate
Inhalation	may irritate respiratory passages; vapour titres above 200-300ppm may cause headache, dizziness, drowsiness, intoxication – <i>at this level, methanol vapour is severely irritating</i> ;
Ingestion	dizziness, headache, drowsiness, intoxication – <i>not a route of industrial exposure</i>

**NOTE: The absorption of methanol by ingestion or by inhalation may cause blindness!**

### Effects, Chronic Exposure

General	prolonged exposure may cause dermatitis; may damage liver & kidneys; impairment of vision
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	no known effect in humans or animals
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD <sub>50</sub> (oral) (monkey)	5600mg/kg (rat), 7300mg/kg (mouse), 7500mg/kg (dog), 14,200mg/kg (rabbit), 7000mg/kg
LD <sub>50</sub> (skin)	15,800mg/kg (rabbit)
LC <sub>50</sub> (inhalation)	64,000ppm (rat), 62,000ppm (rabbit)

**WARNING: Methyl alcohol is eliminated from the body slowly. If toxic effects are seen or suspected the victim should have no further exposure for a week, even to airborne titres below TWAEV!**

**Please ensure that this MSDS is given to, and explained to people using this product.**

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**4. FIRST AID**

- SKIN: Wash with plenty of water. Remove contaminated clothing and do not reuse until thoroughly laundered.  
 EYES: Wash eyes with plenty of water, holding eyelids open. Seek medical assistance promptly if there is irritation.  
 INHALATION: Remove from contaminated area promptly. **CAUTION: Rescuer must not endanger himself!** If breathing stops, administer artificial respiration and seek medical aid promptly.  
 INGESTION: Give plenty of water to dilute product. Do not induce vomiting (NOTE below). Keep victim quiet. If vomiting occurs, lower victim's head below hips to prevent inhalation of vomited material. Seek medical help promptly.

*Inadvertent inhalation of vomited material may seriously damage the lungs. The danger of this is greater than the risk of poisoning through absorption of this relatively low-toxicity substance. The stomach should only be emptied under medical supervision, and after the installation of an airway to protect the lungs.*

**5. PHYSICAL PROPERTIES**

Odour & Appearance	clear, colourless, hygroscopic liquid with sharp, penetrating odour
Odour Threshold	160ppm – <i>threshold varies widely; warning properties considered poor</i>
Vapour Pressure	96mmHg / 12.8kPa (20°C / 68°F)
Evaporation Rate ( <i>Butyl Acetate = 1</i> )	4.1
Vapour Density (air = 1)	1.1
Boiling Range	65°C / 149°F
Freezing Point	-98°C / -144°F
Specific Gravity	0.793 (20/20°C)
Water Solubility	complete
Also soluble in	most organic solvents; limited solubility in long-chain aliphatic hydrocarbons like kerosene
Viscosity	0.6 centipoise (25°C / 77°F)
pH	none – ( <i>does not liberate hydrogen ions when dissolved</i> )
Conversion Factor	1ppm = 1.31mg/m <sup>3</sup>
Molecular Weight	32grams per mole

**6. FLAMMABILITY & FIRE FIGHTING**

Flash Point	11°C / 52°F (closed cup) – <i>also reported as 12°C / 54°F</i>
Autoignition Temperature	above 385°C / 725°F – <i>also reported as 464°C &amp; 470°C</i>
Flammable Limits	6% – 36% – <b>Warning: the flammable range is unusually broad</b>
Combustion Products	carbon monoxide, nitrogen oxides, smoke, formaldehyde & others
Fire Fighting Precautions	foam, dry chemical, water fog, water spray only to cool & dilute, product floats on water – water jet spreads flames; fire fighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge on agitation or pumping

**NOTE: Methanol burns with an almost invisible pale blue flame. Solutions containing as little as 20% methanol can burn.**

**7. STABILITY / REACTIVITY**

Dangerously Reactive With	strong oxidising agents; halogens, strong acids or acid anhydrides; alkali metals; reacts explosively with powdered aluminium or magnesium; and with diethyl zinc; acetyl bromide
Also Reactive With	corrodes aluminium, copper and some grades of carbon steel at elevated temperature, attacks some elastomers including nylon and ABS
Stability	stable; will not polymerize
Decomposes in Presence of	not known
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

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## 8. PROTECTIVE EQUIPMENT / EXPOSURE CONTROL

ACGIH TLV	200ppm / 262mg/m <sup>3</sup>	STEL	250ppm / 327mg/m <sup>3</sup>
OSHA PEL	200ppm / 260mg/m <sup>3</sup>		
Ventilation	mechanical ventilation may be required to control airborne titre below regulated limits		
Hands	butyl or "Viton" gloves recommended – <i>other types may also protect; consult supplier to confirm suitability</i>		
Eyes	safety glasses with side shields – <i>always protect the eyes</i>		
Clothing	no special protective clothing is required		

## 9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat, oxidising agents and substances listed in Part 7. Use non-sparking bronze or aluminium hand tools. All electrical and mechanical equipment (including lighting, switchgear and forklift trucks) used with or around this product must be explosion-proof.

Although this product cannot retain a static charge on agitation or transfer from one container to another, its flash point is low and it is prudent to ground or electrically bond both the source container and the receiving container, and transfer pump before transferring contents. Avoid splashing by ensuring that the product nozzle is below the surface in the receiving container. Empty containers may contain a flammable / explosive vapour. Always ensure that containers, whether empty or full, or part full, are tightly sealed unless in use.

Avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, and ventilation is impossible or impractical, wear a suitable respirator with organic vapour cartridge.

Never cut, drill, weld or grind on or near this container. Avoid contact with skin and wash work clothes frequently. An eye bath and safety shower must be available near the workplace.

**NOTE: Methanol burns with an almost invisible pale blue flame. Solutions containing as little as 20% methanol can burn.**

## 10. SPILL PROCEDURES

***Serious Fire Potential: blanket spill with foam as a precaution against accidental ignition. Take extreme care to avoid sparks – do not operate (turn on OR off) electrical appliances near spill, unless explosion proof.***

Leak Precaution	dyke to control spillage and prevent environmental contamination
Handling Spill	ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep & pick up using plastic or aluminium shovel, & store in closed containers for recycling or disposal

## 11. DISPOSAL

Waste Disposal Containers	<b>do not flush to sewer</b> , recycle solvent if possible, may be incinerated in approved facility <b>Drums</b> should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. <b>Pails</b> must be vented and thoroughly dried prior to crushing and recycling. <b>IBCs</b> (intermediate bulk containers): polyethylene bottle must be pressure tested & recertified at 30 months. Replace at 60 months (5yrs). Steel containers must be inspected, pressure tested & recertified every 5 years. <i>Never cut, drill, weld or grind on or near this container, even if empty</i>
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## 12. ENVIRONMENTAL INFORMATION

Bioaccumulation	this product is not a bioaccumulator; biological half-life is 30-52hours
Biodegradation reported	this product degrades readily and rapidly in the presence of oxygen; various degradation rates eg: 48% in 5 days & 93% in 2 days; ½-life in sandy loam 1-3 days; anaerobic degradation also rapid
Abiotic Degradation	this product reacts slowly with atmospheric hydroxyl radicals; its estimated half-life in air is 17 days
Mobility in soil, water	this product is water soluble and will move readily in soil and water
<b>Aquatic Toxicity</b>	
LC <sub>50</sub> (Fish, 96hr)	15,400mg/litre (Lepomis macrochirus), 8530, 10,800 & 20,100mg/litre (Oncorhynchus mykiss), 28,100 & 29,400mg/litre (Pimephelas promelas), 20,000mg/litre (Salmo gairdneri), 7900-26,070mg/litre (Agonus cataphractus), 28,000mg/litre (Alburnus alburnus) & others
EC <sub>50</sub> (Crustacea, 48hr)	>10,000mg/litre (Daphnia magna), 12,000mg/litre (Nitocra spinipes)
EC <sub>50</sub> (Algae)	3600 & 28,000mg/litre (Chlorella pyrenoidosa)
EC <sub>50</sub> (Bacteria)	71,210mg/litre (municipal sewage sludge), 7690mg/litre (Paramecium caudatum) & others

## 13. TRANSPORT REGULATIONS

<b>Canada TDG</b>	<b>PIN</b>	<b>UN-1230</b>	
<b>AND</b>	<b>Shipping Name</b>	<b>methanol</b>	
<b>U.S.A. 49 CFR</b>	<b>Class</b>	<b>3, 6.1</b>	<b>(U.S.A 49 CFR Class 3 only, no subsidiary Class)</b>
	<b>Packing Group</b>	<b>II</b>	
<b>Marine Pollutant</b>		<b>not a marine pollutant</b>	

## 14. EMERGENCY INFORMATION

<b>Canada</b>	<b>Call CANUTEC (collect)</b>	<b>(613) 996-6666</b>
<b>U.S.A.</b>	<b>Call CHEMTREC</b>	<b>(800) 424-9300</b>

## 15. REGULATIONS

<b>Canada DSL</b>	<b>on inventory</b>
<b>U.S.A. TSCA</b>	<b>on inventory</b>
<b>Europe EINECS</b>	<b>on inventory</b>

**Immediately Dangerous to Life or Health:** 6000 ppm

**Allowable Tolerances:** Residues of methanol are exempted from the requirement of a tolerance when used as a solvent in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Residues of methanol are exempted from the requirement of a tolerance when used as a synergist in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Residues of methanol are exempted from the requirement of a tolerance when used as a solvent, cosolvent in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals.

**OSHA Standards:** Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 200 ppm (260 mg/cu m). Vacated 1989 OSHA PEL TWA 200 ppm (260 mg/cu m); STEL 250 ppm (325 mg/cu m), skin designation, is still enforced in some states.

**NIOSH Recommendations:** Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 200 ppm (260 mg/cu m), 15 Min Short-Term Exposure Limit: 250 ppm (325 mg/cu m), skin.

**Threshold Limit Values:** 8 hr Time Weighted Avg (TWA): 200 ppm; 15 min Short Term Exposure Limit (STEL): 250 ppm. Skin. Biological Exposure Index (BEI): Determinant: methanol in urine; Sampling Time: end of shift; BEI: 15 mg/L. The determinant may be present in biological specimens collected from subjects who have not been occupationally exposed, at a concentration which could affect interpretation of the result. Such background concentrations are incorporated in the BEI value. The determinant is nonspecific, since it is also observed after exposure to other chemicals.

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### 15. REGULATIONS, cont'd

**Atmospheric Standards:** This action promulgates standards of performance for equipment leaks of Volatile Organic Compounds (VOC) in the Synthetic Organic Chemical Manufacturing Industry (SOCMI). The intended effect of these standards is to require all newly constructed, modified, and reconstructed SOCMI process units to use the best demonstrated system of continuous emission reduction for equipment leaks of VOC, considering costs, non air quality health and environmental impact and energy requirements. Methanol is produced, as an intermediate or a final product, by process units covered under this subpart. Listed as a hazardous air pollutant generally known or suspected to cause serious health problems, The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. Methanol is included on this list.

**State Drinking Water Guidelines:** Florida 5,000 ug/L, Minnesota 3000 ug/L, Wisconsin 5000 ug/L

**CERCLA Reportable Quantities:** Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 5000 lb or 2270 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

**RCRA Requirements:** As stipulated in 40 CFR 261.33, when methanol, as a commercial chemical product or manufacturing chemical intermediate or an off-specification commercial chemical product or a manufacturing chemical intermediate, becomes a waste, it must be managed according to Federal and/or State hazardous waste regulations. Also defined as a hazardous waste is any residue, contaminated soil, water, or other debris resulting from the cleanup of a spill, into water or on dry land, of this waste. Generators of small quantities of this waste may qualify for partial exclusion from hazardous waste regulations (40 CFR 261.5). When methanol is a spent solvent, it is classified as a hazardous waste from a nonspecific source, as stated in 40 CFR 261.31, and must be managed according to State and/or Federal hazardous waste regulations.

**FIFRA Requirements:** Residues of methanol are exempted from the requirement of a tolerance when used as a solvent in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops or to raw agricultural commodities after harvest. Residues of methanol are exempted from the requirement of a tolerance when used as a synergist in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Residues of methanol are exempted from the requirement of a tolerance when used as a solvent, cosolvent in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals. As the federal pesticide law FIFRA directs, EPA is conducting a comprehensive review of older pesticides to consider their health and environmental effects and make decisions about their future use. Under this pesticide reregistration program, EPA examines health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether they are eligible for reregistration. In addition, all pesticides must meet the new safety standard of the Food Quality Protection Act of 1996. Pesticides for which EPA had not issued Registration Standards prior to the effective date of FIFRA '88 were divided into three lists based upon their potential for human exposure and other factors, with List B containing pesticides of greater concern and List D pesticides of less concern. Methyl alcohol is found on List D. Case No: 4003; Pesticide type: insecticide, fungicide, herbicide, antimicrobial; Case Status: RED Approved 3/95; OPP has made a decision that some/all uses of the pesticide are eligible for reregistration, as reflected in a Reregistration Eligibility Decision (RED) document ; Active ingredient (AI): methyl alcohol; AI Status: The active ingredient is no longer contained in any registered products. Thus, we characterize it as "cancelled."

**FDA Requirements:** Methyl alcohol is an indirect food additive for use only as a component of adhesives. Methyl alcohol may be present in the following foods under the conditions specified: (a) In spice oleoresins as a residue from the extraction of spice, at a level not to exceed 50 parts per million. (b) In hops extract as a residue from the extraction of hops, at a level not to exceed 2.2 percent by weight; Provided, that: (1) The hops extract is added to the wort before or during cooking in the manufacture of beer. (2) The label of the hops extract specifies the presence of methyl alcohol and provides for the use of the hops extract only as prescribed by paragraph (b)(1) of this section.

### 16. PREPARATION INFORMATION

*Prepared for Megaloid Laboratories by Peter Bursztyn, (705) 734-1577*

*With data from RTECS, Haz. Substance Data Base, Cheminfo (CCOHS), IUCLID Datasheets (European Chem. Substance Info. System), & others, as available*

*Preparation Date: **May 2004**      Revision Date: **May 2007, May 2010***

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