

Safety Data Sheet

1. PRODUCT IDENTIFICATION

Name **Glycol Ether EM**
Synonyms 2-methoxyethanol; ethylene glycol (mono)methyl ether; Glycol Ether EM; EM, EGME
CAS# 109-86-4
Europe EC # 203-713-7
Material Use solvent

EMERGENCY INFORMATION

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

2. HAZARDS

GHS Class	flammable (3)	acute oral (4)	acute skin (4)	acute inhal. (4)	reproduction (1B)	STOT (3)
Signal Words	WARNING	WARNING	WARNING	WARNING	DANGER	WARNING
Hazard Statements	flammable liquid & vapour (H226)	harmful if swallowed (H302)	harmful if in contact with skin (H312)	harmful if inhaled (H332)	may damage fertility & the unborn child (H360) – by skin, oral or inhalation	may damage blood forming system causing anaemia (H373) by prolonged inhalation



GHS Precautionary Statements for Labelling

P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.
P240 Ground or bond container and receiving equipment.
P241 Use explosion-proof electrical, ventilating and lighting equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P262 Do not get in eyes, on skin or on clothing.
P264 Wash thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P280 Wear eye protection, protective gloves and clothing of butyl.
P313 & P333 If skin irritation or rash occurs, get medical advice/attention.

WHMIS Class

B 3, D 1B, D 1A

Key:

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



3. COMPOSITION

	%	TWAEV / TLV ppm / mg/m ³	LD ₅₀ (mg/kg) ORAL	LD ₅₀ (mg/kg) SKIN	LC ₅₀ ppm INHALATION
2-Methoxyethanol	100%	0.1 / 0.3 (skin)	890	1300	1960

Please ensure that this SDS 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 if there is any 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. FIRE FIGHTING & FLAMMABILITY

Flash Point	37°C/99°F (closed cup DIN 51755); also 39°C/102°F (closed cup) & 42°C/107°F (closed cup)
Autoignition Temperature	285°C / 545°F
Flammable Limits	1.8% – 14%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Firefighting Precautions	alcohol foam, dry chemical, water fog or spray only to cool & dilute, product floats on water – water jet spreads flames; firefighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge on agitation or pumping

6. ACCIDENTAL RELEASE MEASURES

Summer Fire Risk: At over 35°C, blanket spill with foam as a precaution against accidental ignition. Take 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
- NOTE: If spill is extensive, and ventilation is inadequate, consider wearing an air-supplied respirator.**

7. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, oxidising agents & substances listed in Part 10.

Although the flash point is above ambient temperature in all but the hottest climates, grounding or bonding all equipment to prevent static discharge is recommended.

This product reacts with oxygen in the air on prolonged storage to form explosive peroxides. If prolonged storage of a part container is anticipated, flush headspace with dry nitrogen gas prior to sealing. Empty containers may contain a flammable or explosive vapour. Always ensure that containers, whether empty or full, are tightly sealed unless in use.

Evaporation concentrates any peroxides which may have formed, creating the risk of explosion. If recycling the product by distillation, *never evaporate to dryness.*

If material is warmed in use, avoid breathing product vapour. Use with adequate ventilation. If dealing with a spill, wear a suitable respirator.

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.

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8. EXPOSURE CONTROL & PERSONAL PROTECTION

Ontario TWAEV	0.1ppm / 0.3mg/m ³ (skin)	Ontario STEV	not listed
ACGIH TLV	0.1ppm / 0.3mg/m ³ (skin)	ACGIH STEL	not listed
OSHA PEL	25ppm / 80mg/m ³ (skin)	OSHA STEL	not listed
Ventilation	mechanical ventilation may be required to maintain airborne titre below regulated limits		
Hands	wear butyl rubber or "Tychem TM" or "Tychem TK" gloves – <i>consult supplier to confirm suitability</i>		
Eyes	safety glasses with side shields – <i>always protect the eyes</i>		
Clothing	wear impermeable (above) apron, boots, & long sleeves if there is any likelihood of splashing,		

9. PHYSICAL PROPERTIES

Odour & Appearance	clear, colourless liquid with mild ether odour
Odour Threshold	2.4 – 4.4ppm
Vapour Pressure	6.2mmHg / 0.83kPa (20°C / 68°F)
Evaporation Rate (<i>Butyl Acetate = 1</i>)	0.5
Vapour Density (air = 1)	2.6
Boiling Range	124°C / 255°F
Freezing Point	-85°C / -121°F
Specific Gravity	0.965 (20/20°C)
Water Solubility	complete
Also soluble in	most organic solvents
Log K _{oc} (<i>Octanol/H₂O Partition Coefficient</i>)	-0.75 to -0.85
Viscosity	1.7centipoise (25°C / 77°F)
pH	none – (<i>does not liberate hydrogen ions when dissolved</i>)
Conversion Factor	1ppm = 3.11mg/m ³
Molecular Weight	76grams per mole

10. REACTIVITY

Dangerously Reactive With	strong oxidising agents; strong acids, acid anhydrides or alkalis may cause vigorous reaction
Also Reactive With	attacks certain plastics
Stability	stable; will not polymerize
Decomposes in Presence of	oxygen & light; long term oxygen (air) alone promotes formation of explosive peroxides
Decomposition Products	peroxides, acetaldehyde and methanol
Sensitive to Mechanical Impact	no

11. TOXICITY**Effects, Acute Exposure**

Skin Contact	not irritating under most circumstances ¹
Skin Absorption	slight; toxic effects unlikely by this route
Eye Contact	may be slightly irritating ¹
Inhalation	may cause dizziness, drowsiness, confusion, nausea,
Ingestion	headache, nausea, confusion, agitation, muscle weakness, increased heart rate, deep breathing, metabolic acidosis & cyanosis (blue skin tint) – <i>not a route of industrial exposure</i>
LD ₅₀ (oral)	2370, 2460 & 3250mg/kg (rat), 2560 & 2800mg/kg (mouse), 890mg/kg (rabbit), 950mg/kg (guinea pig)
LD ₅₀ (skin)	1280, 1300, 1340 ¹ , 2000 & 3930 ¹ mg/kg (rabbit)
LC ₅₀ (inhalation)	1960 & 4600ppm (mouse), >4000 & >5000ppm (rat) ¹

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11. TOXICITY, cont'd**Effects, Chronic Exposure**

General	may cause headache, lethargy, poor co-ordination, weakness, altered personality, anaemia, decreased white blood cell count, and bone marrow damage; <i>some of these were caused by skin exposure alone</i>
Sensitising	not a sensitiser in humans or animals
Carcinogen/Tumorigen	not considered a tumorigen or a carcinogen in humans or animals
Reproductive Effect	fetal malformation, decreased fertility and low sperm count have been seen in rodents at doses causing no maternal symptoms; <i>several reports do not consider Glycol Ether EM to be a reproductive effector in rodents</i> ¹ , several epidemiological studies show reproductive effects in humans ¹
Mutagen	no known effect on humans or animals
Teratogen	several epidemiological studies suggest that Glycol Ether EM may be a teratogen by skin & by inhalation exposure ¹
Synergistic With	not known

12. ECOLOGICAL INFORMATION

Bioaccumulation	not a bioaccumulator; readily eliminated from the body (~70% within 48hr)
Biodegradation	biodegrades readily & rapidly in the presence of oxygen; 73-97% in 8 to 14 days – several tests anaerobic biodegradation of 99% in 21 days has been recorded
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 11.5, 17, & 35hours
Mobility in soil, water	water soluble; moves readily in soil and water
Aquatic Toxicity	
LC ₅₀ (Fish, 96 hr)	14,980mg/litre (Salmo gairdneri), 9650mg/litre (Lepomis macrochirus & Menidia beryllina), 16,000mg/litre (Oncorhynchus mykiss) ¹ , >10,000mg/litre (Lepomis macrochirus) ¹
LC ₅₀ (Crustacea, 24hr)	>10,000mg/litre (Daphnia magna & Artemia salina), 27,000mg/litre (Daphnia magna) ¹ , 9400mg/litre (Brachionus caliciflorus) ¹
EC ₅₀ (Algæ, 72 or 96hr)	>10,000mg/litre (Scenedesmus quadricauda), 12,100mg/litre (Pseudokirchnerella subcapitata) ¹
LC ₅₀ (Bacteria)	3000mg/litre (“domestic activated sewage sludge”) ¹

13. DISPOSAL

Waste Disposal	do not flush to sewer ; may be incinerated in approved facility with flue gas monitoring & scrubbing
Containers	Drums should be reused. Recondition and pressure test by a licensed reconditioner prior to re-use. Pails must be vented and thoroughly dried prior to crushing and recycling. IBCs (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>

14. TRANSPORT CLASSIFICATION

Canada TDG	PIN	UN - 1188
AND	Shipping Name	ethylene glycol monomethyl ether
U.S.A. 49 CFR	Class & Packing Group	3 (III)
Marine Pollutant		not a marine pollutant
ERAP Required		NO



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15. REGULATIONS

Canada DSL	on inventory
U.S.A. TSCA	on inventory
Europe EINECS	on inventory

U.S.A. Regulations:

Immediately Dangerous to Life or Health: 200 ppm

OSHA Standards: Permissible Exposure Limit: Table Z-1 8-hr Time Weighted Avg: 25 ppm (80 mg/cu m), skin designation.

NIOSH Recommendations: NIOSH recommends that 2-methoxyethanol (2ME) ... be regarded in the workplace as having the potential to cause adverse reproductive effects in male and female workers. These recommendations are based on the results of several recent studies that have demonstrated dose related embryotoxicity and other reproductive effects in several species of animals exposed by different routes of administration. Appropriate controls should be instituted to minimize worker exposure to 2ME. NIOSH suggests that producers, distributors, and users of 2ME give this information to their workers and customers and that trade associations, and unions inform their members. Recommended Exposure Limit: 10 Hr Time-Weighted Avg: 0.1 ppm (0.3 mg/cu m), skin.

Threshold Limit Values: 8 hr Time Weighted Avg (TWA): 0.1 ppm, skin. Excursion Limit Recommendation: Excursions in worker exposure levels may exceed 3 times the TLV-TWA for no more than a total of 30 minutes during a work day, and under no circumstances should they exceed 5 times the TLV-TWA, provided that the TLV-TWA is not exceeded.

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. Ethylene glycol monomethyl ether is produced, as an intermediate or a final product, by process units covered under this subpart.

FIFRA Requirements: 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. Methoxyethanol is found on List C. Case No: 3036; Pesticide type: fungicide, antimicrobial; Case Status: No products containing the pesticide are actively registered. Therefore, we are characterizing the case as "cancelled." Under FIFRA, pesticide producers may voluntarily cancel their registered products. EPA also may cancel pesticide registrations if registrants fail to pay required fees or make/meet certain reregistration commitments, or if EPA reaches findings of unreasonable adverse effects.; Active ingredient (AI): methoxyethanol; Data Call-in (DCI) Date(s): 09/30/1992; AI Status: The active ingredient is no longer contained in any registered products ... "cancelled."

16. OTHER INFORMATION

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

Data from RTECS, HSDB (Haz. Substance Data Base), Cheminfo (CCOHS), IUCLID Datasheets (ESIS – European Chem. Substance Info. System), & others.

Preparation Date: **October 2002** Revision Date: **October 2005, October 2008, November 2011, November 2014**

(1) European Chemicals Agency (ECHA) dossier on 2-Methoxyethanol:

http://apps.echa.europa.eu/registered/data/dossiers/DISS-9d98cc35-b1d8-41f5-e044-00144f67d249/DISS-9d98cc35-b1d8-41f5-e044-00144f67d249_DISS-9d98cc35-b1d8-41f5-e044-00144f67d249.html

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