# Safety Data Sheet

**Product Name:** Glycol Ether EM

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

<table>
<thead>
<tr>
<th>EMERGENCY INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Canada</strong></td>
</tr>
<tr>
<td><strong>U.S.A.</strong></td>
</tr>
</tbody>
</table>

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.

   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**

   **Key:**

   B 3, D 1B, D 1A

   - 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**

<table>
<thead>
<tr>
<th>%</th>
<th>TWAEV / TLV ppm / mg/m³</th>
<th>LD₅₀ (mg/kg) ORAL</th>
<th>LD₅₀ (mg/kg) SKIN</th>
<th>LC₅₀ ppm INHALATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Methoxyethanol</td>
<td>100%</td>
<td>0.1 / 0.3 (skin)</td>
<td>890</td>
<td>1300</td>
</tr>
</tbody>
</table>

**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**

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

6. **ACCIDENTAL RELEASE MEASURES**

<table>
<thead>
<tr>
<th>Measure</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer Fire Risk</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Leak Precaution**

<table>
<thead>
<tr>
<th>Handling Spill</th>
<th>Dyke to control spillage and prevent environmental contamination</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Ventilate contaminated area; recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep &amp; pick up using plastic or aluminium shovel, &amp; store in closed containers for recycling or disposal</td>
</tr>
</tbody>
</table>

**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 0.1 ppm / 0.3 mg/m³ (skin)  Ontario STEV not listed
ACGIH TLV 0.1 ppm / 0.3 mg/m³ (skin)  ACGIH STEL not listed
OSHA PEL 25 ppm / 80 mg/m³ (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 – consult supplier to confirm suitability

Eyes: safety glasses with side shields – always protect the eyes

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 – 4.4 ppm
Vapour Pressure: 6.2 mmHg / 0.83 kPa (20°C / 68°F)
Evaporation Rate (Butyl Acetate = 1): 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 Kow (Octanol/H₂O Partition Coefficient): -0.75 to -0.85
Viscosity: 1.7 centipoise (25°C / 77°F)
pH: none – (does not liberate hydrogen ions when dissolved)
Conversion Factor: 1 ppm = 3.11 mg/m³
Molecular Weight: 76 grams 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 circumstances¹
Skin Absorption: slight; toxic effects unlikely by this route
Eye Contact: may be slightly irritating¹
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) – not a route of industrial exposure

LD₅₀ (oral): 2370, 2460 & 3250 mg/kg (rat), 2560 & 2800 mg/kg (mouse), 890 mg/kg (rabbit), 950 mg/kg (guinea pig)
LD₅₀ (skin): 1280, 1300, 1340¹, 2000 & 3930¹ mg/kg (rabbit)
LC₅₀ (inhalation): 1960 & 4600 ppm (mouse), >4000 & >5000 ppm (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; some of these were caused by skin exposure alone
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; several reports do not consider Glycol Ether EM to be a reproductive effector in rodents\(^1\), 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 \(\frac{1}{2}\)-life in air is 11.5, 17, & 35hours
Mobility in soil, water water soluble; moves readily in soil and water

Aquatic Toxicity
\(\text{LC}_{50} \) (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)\(^1\)
\(\text{LC}_{50} \) (Crustacea, 24hr) >10,000mg/litre (Daphnia magna & Artemia salina), 27,000mg/litre (Daphnia magna)\(^1\), 9400mg/litre (Brachionus calcificlorus)\(^1\)
\(\text{EC}_{50} \) (Algae, 72 or 96hr) >10,000mg/litre (Scenedesmus quadricauda), 12,100mg/litre (Pseudokirchnerella subcapitata)\(^1\)
\(\text{LC}_{50} \) (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.

Never cut, drill, weld or grind on or near this container, even if empty

14. TRANSPORT CLASSIFICATION

<table>
<thead>
<tr>
<th>Canada TDG</th>
<th>PIN</th>
<th>UN - 1188</th>
</tr>
</thead>
<tbody>
<tr>
<td>AND</td>
<td>Shipping Name</td>
<td>ethylene glycol monomethyl ether</td>
</tr>
<tr>
<td>U.S.A. 49 CFR</td>
<td>Class &amp; Packing Group</td>
<td>3 (III)</td>
</tr>
<tr>
<td>Marine Pollutant</td>
<td></td>
<td>not a marine pollutant</td>
</tr>
<tr>
<td>ERAP Required</td>
<td></td>
<td>NO</td>
</tr>
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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/maintain 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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