Established in 1981
megaloid laboratories limited
2221 Ninth Line | Oakville, ON L6H 7G7
Phone: 905-337-7411 | Fax: 905-337-1686
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Material Safety Data for: Ethylene Glycol, Antifreeze grade

1. PRODUCT INDENTIFICATION

Name	**ethylene glycol, antifreeze grade**
Synonyms	**ethylene glycol & diethylene glycol (impurity)**
CAS#	**107-21-1 & 111-46-6**
Product Uses	**automotive antifreeze**

2. INGREDIENTS

	%	TWAEV / TLV mg/m^3	LD_{50} ORAL	(mg/kg) SKIN	LC_{50} ppm INHALATION
ethylene glycol	>95%	40 / 100	1650	9500	10,900
diethylene glycol	<5%	not listed	2300	11,890	1070
water	<1%	none	90,000	not toxic	not toxic

3. (a) HAZARDS SUMMARY

Hazards, Quick Guide: delayed toxicity on ingestion; may cause kidney & nervous system damage; possible teratogen

Canada – WHMIS	**D 1B, D 2A**
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*
U.S.A. – HMIS	**Health – 2, Fire – 1, Reactivity – 0**
Key:	***0****=minimal,* ***1****=slight,* ***2****=moderate,* ***3****=serious,* ***4****=severe*

3. (b) HAZARDS – TOXICITY

Effects, Acute Exposure

Skin Contact	no effect
Skin Absorption	slight; no toxic effects likely by this route
Eye Contact	no effect
Inhalation	vapour irritating above 50ppm; intolerable above 95ppmn – *inhalation unlikely under industrial conditions due to low vapour pressure & elevated viscosity*
Ingestion	the product is an alcohol with similar intoxication/depression symptoms to ethyl alcohol; high doses may cause convulsions & coma; survival may be followed by renal failure after 3 days & ***possible death***

Effects, Chronic Exposure

General	prolonged absorption may cause vision to deteriorate & damage kidneys*
Sensitising	not a sensitiser in humans or animals – *very few human cases reported*
Carcinogen/Tumorigen	not considered a carcinogen in humans or animals; tumorigen in rodents receiving high but sub-lethal oral doses – *not an expected route of industrial exposure*
Reproductive Effect	teratogen in rodents given high but sub-lethal oral doses; *developmental abnormalities reported in* the *children of mothers exposed to both EG and ethylene glycol monomethyl ether*
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD_{50} (oral)	1650 & 2000mg/kg (cat); 4700-5000mg/kg (rat), 5500mg/kg (mouse & dog), 6610mg/kg (guinea pig)
LD_{50} (skin)	10,620mg/kg (rabbit)
LC_{50} (inhalation)	2725mg/m^3 (rat)

NOTE: *LD_{50} & LC_{50} test data vary widely between species. Relevance to human toxicity should not be assumed.*

** Mammals metabolise EG into oxalic acid. The renal crystallisation of oxalic acid is responsible for renal failure & lethality.*

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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.

NOTE TO DOCTOR: *Following gastric lavage, oral ethanol and calcium gluconate help to reduce toxicity. If kidney function is normal, administer 4 litres of water daily to speed glycol excretion. If renal function is poor, dialysis should be used to speed glycol elimination.*

5. PHYSICAL PROPERTIES

Odour & Appearance	clear, slightly viscous, colourless, hygroscopic, odourless liquid
Odour Threshold	none – odourless
Vapour Pressure	>0.05mmHg / >0.007kPa (20°C / 68°F)
Evaporation Rate (*Butyl Acetate = 1*)	below 0.01 – not considered volatile
Vapour Density (air = 1)	>2.1
Boiling Range	215°C / 419°F
Freezing Point	<-13°C / <9°F
Specific Gravity	1.115 (20/20°C)
Water Solubility	complete
Also soluble in	lower alcohols, ethers, esters, ketones; poorly soluble in hydrocarbons & chlorinated HCs
Viscosity	>21centipoise (20°C / 68°F)
pH	none – (*does not liberate hydrogen ions when dissolved*)
Conversion Factor	1ppm = 2.53g/m^3 (*ethylene glycol*); 1ppm = 4.3mg/m^3 (*diethylene glycol*)
Molecular Weight	62grams/mole (*ethylene glycol*); 106grams/mole (*diethylene glycol*)

NOTE: The small % of diethylene glycol present alters the properties of pure ethylene glycol as indicated above

6. FLAMMABILITY & FIRE FIGHTING

Flash Point	121°C / 250°F (closed cup)
Autoignition Temperature	214°C / 417°F
Flammable Limits	3.2% – 22%
Combustion Products	carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments
Fire Fighting Precautions	water fog or water spray; fire fighters must wear SCBA
Static Charge Accumulation	cannot accumulate a static charge on agitation or pumping

7. STABILITY / REACTIVITY

Dangerously Reactive With	strong oxidising agents; perchloric acid
Also Reactive With	strong acids or strong alkalies may cause decomposition with release of hydrogen; strong acids cause gas evolution and increased temperature; corrosive to aluminium above 100°C
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	*ethylene glycol:* 40ppm / 100mg/m^3, *diethylene glycol:* not listed
OSHA PEL	not listed
STEL	not listed
Ventilation	no special ventilation required; if mist or vapour is created, point source ventilation should be installed
Hands	no special protective gloves required
Eyes	safety glasses with side shields – *always protect the eyes*
Clothing	no special protective clothing required

9. HANDLING & STORAGE

Store in a cool, dry environment, away from sources of ignition, heat and oxidising agents. This product absorbs moisture from the air. Ensure that containers are tightly sealed. Bulk storage tanks should have moisture traps on their vents.

Avoid breathing product vapour/mist. Use with adequate ventilation.

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.

WARNING: This product has a sweet taste, making it attractive for animals and children to drink. Keep away from animals and children.

Ensure that spills are dealt with promptly to avoid inadvertent poisoning.

10. SPILL PROCEDURES

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

WARNING: Depending on the surface, spilled product may be very slippery!

11. DISPOSAL

Waste Disposal	**do not flush to sewer**, recycle if possible, may be incinerated in approved facility after mixing with a suitable flammable waste
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

12. ENVIRONMENTAL INFORMATION

The data below is for pure ethylene glycol. The small % of diethylene glycol present makes little difference to these data.

Bioaccumulation	this product is highly water soluble and cannot bioaccumulate; biological half-life 3-5 hours
Biodegradation	this product degrades readily and rapidly in the presence of oxygen; biodegradation essentially complete in 1-4 days
Abiotic Degradation	this product reacts with atmospheric hydroxyl radicals; its estimated half-life in air is 50hours
Mobility in soil, water	this product is water soluble and moves readily in soil and water
Aquatic Toxicity	
LC_{50} (Fish, 96hr)	>10,000mg/litre (Lepomis macrochirus), 41,000mg/litre (Oncorhynchus mykiss), >10,000mg/litre (Pimephales promelas)
EC_{50} (Crustacea, 48hr)	>100mg.litre (Crangon crangon)

NOTE: Non-mammalian species metabolise ethylene glycol differently from mammals. Its toxicity to non-mammalians is very low.

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13. TRANSPORT REGULATIONS

Canada TDG	**PIN**	**UN-not regulated for transport**
AND	**Shipping Name**	**not regulated for transport**
U.S.A. 49 CFR	**Class**	**not regulated for transport**
	Packing Group	**not regulated for transport**
Marine Pollutant		**not a marine pollutant**

14. EMERGENCY INFORMATION

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

15. REGULATIONS

Canada DSL	**on inventory**
U.S.A. TSCA	**on inventory**
Europe EINECS	**on inventory (*ethylene glycol:* EC# 203-473-3 & *diethylene glycol:* EC# 203-872-2)**

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 2011*** *Revision Date*: **-**

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