



## Safety Data Sheet

### 1. PRODUCT IDENTIFICATION

Name	<b>Radiator Antifreeze</b>
Synonyms	Ethylene Glycol blend with proprietary anticorrosion salts
CAS#	107-21-1*
Product Uses	motor vehicle antifreeze

### 2. HAZARDS

**Quick Guide:** delayed toxicity (kidney damage) – potentially deadly – on ingestion; rodent teratogen

#### Canada – WHMIS

Key:

#### 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, **F** – Reactive Substance

#### U.S.A. – HMIS

Key:

#### Health – 2, Fire – 1, Reactivity – 0

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

### 3. COMPOSITION

	%	TWAEV / TLV mg/m <sup>3</sup>	LD <sub>50</sub> (mg/kg) ORAL	LD <sub>50</sub> (mg/kg) SKIN	LC <sub>50</sub> ppm INHALATION
Ethylene Glycol	95-97%*	40 / 100	1650	9500	10,900
Water (CAS# 7732-18-5)	1-3%*	none	90,000	not toxic	not toxic

\*Concentration varies depending on the quantity and type of additives present. These additives do not change the hazard classification of ethylene glycol

### 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. <b>CAUTION: Rescuer must not endanger himself!</b> 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. FIRE FIGHTING & FLAMMABILITY

Flash Point	111°C / 232°F (closed cup)
Autoignition Temperature	398°C / 748°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

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

**6. ACCIDENTAL RELEASE MEASURES**

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, shovel & store in closed containers for recycling or disposal

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

**7. 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. It is "attractive" for pets and children to drink. Ensure that spills are dealt with promptly to avoid inadvertent poisoning.**

**8. EXPOSURE CONTROL & PERSONAL PROTECTION**

Ontario CEV	40ppm / 100mg/m <sup>3</sup>
ACGIH TLV-C	40ppm / 100mg/m <sup>3</sup>
OSHA PEL-C	20ppm / 50mg/m <sup>3</sup>
STEL (lowest listed)	not listed
Ventilation	mechanical ventilation may be required to control airborne titre; depending on handling procedures
Hands	nitrile or "Viton" gloves recommended – other types may also protect; consult supplier to confirm suitability
Eyes	safety glasses with side shields – always protect the eyes
Clothing	no special protective clothing required

**9. PHYSICAL PROPERTIES**

Odour & Appearance	clear, viscous, fluorescent green*, hygroscopic, odourless liquid
Odour Threshold	none – odourless (any odour indicates an impure product)
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	158°C / 317°F**
Freezing Point	-20°C / -3°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 <sup>3</sup>
Molecular Weight	62grams per mole – ethylene glycol only

\*Colour is added to this product; other colours are possible.

\*\*NOTE: Depending on the additive package, more or less water may be added to the product. This may alter some of the physical properties.

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## 10. REACTIVITY

Dangerously Reactive With	strong oxidising agents, perchloric acid, strong alkalis
Also Reactive With	strong acids
Stability	stable; will not polymerize
Decomposes in Presence of	not known
Decomposition Products	none apart from Hazardous Combustion Products
Sensitive to Mechanical Impact	no

## 11. TOXICITY

### Effects, Acute Exposure

Skin Contact	no effect
Skin Absorption	slight; no toxic effects likely by this route
Eye Contact	no effect
Inhalation	mist becomes irritating above 127mg/m <sup>3</sup> ; intolerable above 240mg/m <sup>3</sup> – <i>inhalation is unlikely under industrial conditions due to low vapour pressure &amp; elevated viscosity</i>
Ingestion	ethylene glycol is an alcohol producing similar intoxication/depression symptoms; high doses may cause convulsions & coma; survival may be followed by renal failure after 3 days <b>&amp; possible death.</b>

**NOTE: Mammals metabolise EG into oxalic acid. The renal crystallisation of oxalic acid is responsible for renal failure & EC's lethality.**

### Effects, Chronic Exposure

General	prolonged absorption may cause vision to deteriorate & damage kidneys
Sensitising	not a sensitiser in humans or animals – <i>very few human cases reported</i>
Carcinogen/Tumorigen	not considered a carcinogen in humans or animals; tumorigen in rodents receiving high but sub-lethal oral doses – <i>not an expected route of industrial exposure</i>
Reproductive Effect of	teratogen in rodents given high but sub-lethal oral doses; <i>developmental abnormalities reported in children of mothers exposed to EG &amp; ethylene glycol monomethyl ether (a higher level of exposure than likely in Canada)</i>
Mutagen	no known effect on humans or animals
Synergistic With	not known
LD <sub>50</sub> (oral)	1650 & 2000mg/kg (cat); 2725, 4700-5000mg/kg (rat), 5500mg/kg (mouse & dog), 6610mg/kg (guinea pig)
LD <sub>50</sub> (skin)	9530mg/kg (rabbit)
LC <sub>50</sub> (inhalation)	2725mg/m <sup>3</sup> (rat)

**NOTE: LD<sub>50</sub> & LC<sub>50</sub> test data vary widely between species. Relevance to human toxicity should not be assumed.**

## 12. ECOLOGICAL INFORMATION

Bioaccumulation	cannot bioaccumulate; biological ½-life 3-5 hours
Biodegradation	degrades readily and rapidly in the presence of oxygen; biodegradation essentially complete in 1-4 days
Abiotic Degradation	reacts with atmospheric hydroxyl radicals; its estimated ½-life in air is 50hours
Mobility in soil, water	water soluble; moves readily in soil & water
<b>Aquatic Toxicity</b>	
LC <sub>50</sub> (Fish, 96hr)	>10,000mg/litre (Lepomis macrochirus), 40,760mg/litre (Oncorhynchus mykiss), 49,000-57,000mg/litre (Pimephales promelas), 16,000mg/litre (Poecilia reticulata)
EC <sub>50</sub> (Crustacea, 48hr)	>20,000mg/litre (Artemia salina), 41,000-57,600mg/litre (Daphnia magna)
EC <sub>50</sub> (Algæ)	6500-7500 & 24,000mg/litre (Selenastrum capricornutum),
EC <sub>50</sub> (Bacteria)	10,000mg/litre (“domestic sewage sludge”), 35,000mg/litre (Paramecium caudatum), 621mg/litre (Photobacterium phosphoreum), 10,000mg/litre (Pseudomonas putida)

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

**NOTE: The inorganic salts which act as corrosion inhibitors in this product do not biodegrade and are not toxic to aquatic life.**

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**13. DISPOSAL**

Waste Disposal **do not flush to sewer**, recycle solvent 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*

**14. TRANSPORT CLASSIFICATION**

Canada TDG	PIN	UN – not regulated for transport
AND	Shipping Name	not regulated for transport
U.S.A. 49 CFR	Class & Packing Group	not regulated for transport
Marine Pollutant		not a marine pollutant
ERAP Required		NO

**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

Europe Classification



Europe Risk Phrases	R: 22 – Harmful if swallowed.
Europe Safety Phrases	S: 2 – Keep out of reach of children.

**Allowable Tolerances:** Ethylene glycol is exempted from the requirement of a tolerance when used as an antifreeze or deactivator for all pesticides used before crop emerges from soil and in herbicides before or after crop emerges in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to growing crops only. Ethylene glycol as a component of pesticide formulations is exempt from the requirement of a tolerance when used in foliar applications to peanut plants.

**OSHA Standards:** Vacated 1989 OSHA PEL Ceiling value 50 ppm (125 mg/cu m) is still enforced in some states.

**NIOSH Recommendations:** NIOSH questioned whether the OSHA PEL proposed for ethylene glycol [ceiling 50 ppm] is adequate to protect workers from recognized health hazards.

**Threshold Limit Values:** Ceiling Limit: 100 mg/cu m (Aerosol only). A4; Not classifiable as a human carcinogen.

**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 is produced, as an intermediate or a final product, by process units covered under this subpart. Listed as a hazardous air pollutant (HAP) 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. Ethylene glycol is included on this list.

**Federal Drinking Water Guidelines:** EPA 14,000 ug/L

**State Drinking Water Guidelines:** Arizona 5500 ug/l, California 14,000 ug/l, Florida 14,000 ug/l, Massachusetts 14,000 ug/l, Minnesota 10000 ug/l, New Hampshire 7000 ug/l, New Jersey 290 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; In the Washington D.C. metropolitan area (202) 426-2675. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

**16. OTHER INFORMATION**

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

Preparation Date: November 2003 Revision Date: August 2006, August 2009, August 2012

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