



Safety Data Sheet

1. PRODUCT IDENTIFICATION

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| Name | Propylene Glycol |
| Synonyms | 1,2-dihydroxypropane; propane-1,2-diol; 1,2-propylene glycol |
| CAS# | 57-55-6 |
| EC# | 200-338-0 |
| Product Uses | non-toxic antifreeze, manufacture of polyester resins & other products |

2. HAZARDS

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| Canada – WHMIS Key: | not controlled under WHMIS <i>B 2 – Flash Point <38°C, B 3 – Flash Point >38°C & <93°C</i> <i>D 1 – Immediately Toxic, D 2 – Chronic Toxicity</i> <i>C – Oxidising Substance, E – Corrosive, F – Reactive Substance</i> |
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GHS Symbols – none required

GHS Class & Category not hazardous under GHS

Signal Words *none required*

Hazard Statements *none required*

3. COMPOSITION

| | % | TWAEV / TLV mg/m ³ | LD ₅₀ (mg/kg) ORAL | LD ₅₀ (mg/kg) SKIN | LC ₅₀ ppm INHALATION |
|----------------------|------|----------------------------------|----------------------------------|----------------------------------|------------------------------------|
| 1,2-Dihydroxypropane | 100% | not listed | >14,800 | 20,800 | not known |

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. FIRE FIGHTING & FLAMMABILITY

| | |
|----------------------------|---|
| Flash Point | 99°C / 210°F (closed cup); also 104°C / 219°F (Pensky-Martens closed cup) |
| Autoignition Temperature | 371°C / 700°F |
| Flammable Limits | 2.6% – 12.5% |
| Combustion Products | carbon monoxide, nitrogen oxides, smoke, part oxidised hydrocarbon fragments |
| Firefighting Precautions | alcohol-resistant foam, dry chemical, water fog, water spray; firefighters 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 | recover free liquid with suitable pumps; absorb residue on an inert sorbent, sweep, shovel & store in closed containers for recycling or disposal |

7. HANDLING & STORAGE

Hygroscopic liquid; store in a dry environment to preserve quality, away from open flame and oxidising agents. Always ensure that containers, whether empty or full, are tightly sealed unless in use.

If product is heated above 100°C / 212°F, ensure adequate ventilation and avoid generating vapour. If mist forms in use, install adequate exhaust ventilation. Never cut, drill, weld or grind on or near this container. Wash work clothes frequently. An eye bath and safety shower should be available near the workplace.

8. EXPOSURE CONTROL & PERSONAL PROTECTION

| | | | |
|----------------------|---|---------------------|------------|
| Ontario TWAEV | 50ppm / 155mg/m ³ (<i>total vapour & aerosol</i>); 10mg/m ³ (<i>aerosol only</i>) | Ontario STEV | not listed |
| ACGIH TLV | not listed | | |
| OSHA PEL | not listed | | |
| Ventilation | exhaust ventilation is required if product mist forms in use or if processing occurs above 100°C | | |
| Hands | no special protective gloves required | | |
| Eyes | safety glasses with side shields – <i>always protect the eyes</i> | | |
| Clothing | no special protective clothing required | | |

9. PHYSICAL PROPERTIES

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|--|--|
| Odour & Appearance | clear, colourless, odourless, viscous, hygroscopic liquid |
| Odour Threshold | not known - odourless |
| Vapour Pressure | 0.08mmHg / 0.011kPa (20°C / 68°F) |
| Evaporation Rate (<i>Butyl Acetate = 1</i>) | 0.01 |
| Vapour Density (air = 1) | 2.5 |
| Boiling Range | 188°C / 370°F |
| Freezing Point | -60°C / -76°F – <i>supercools readily</i> |
| Specific Gravity | 1.037 (20/20°C) |
| Water Solubility | complete |
| Also soluble in | all polar organic solvents & benzene, limited solubility in aliphatic hydrocarbons |
| Partition Coefficient (Octanol/H ₂ O) | -0.92 |
| Viscosity | 56centipoise (20°C / 68°F) |
| pH | none – (<i>does not dissociate into hydrogen ions when dissolved</i>) |
| Molecular Weight | 76 grams per mole |

10. REACTIVITY

| | |
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| Dangerously Reactive With | strong oxidising agents |
| Also Reactive With | attacks polyvinyl chloride; elastomers like Dacron & epoxy are attacked above 95°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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11. TOXICITY

Effects, Acute Exposure

| | |
|-----------------|--|
| Skin Contact | little to no effect |
| Skin Absorption | slight; no toxic effects likely by this route |
| Eye Contact | little to no effect; <i>may sting very briefly, but subsides almost immediately</i> |
| Inhalation | vapour or mist had little if any effect |
| Ingestion | little to no effect; also little effect in experimental long-term inhalation studies |

Effects, Chronic Exposure

| | |
|-------------------------------|---|
| General | prolonged skin exposure has caused irritation in <i>16% of dermatitis patients</i> ; any irritation seen in normal people appears to be caused by skin dehydration due to local osmotic effects, disappearing rapidly after removal of propylene glycol |
| 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 ₅₀ (oral) | 20,000-30,000mg/kg (rat) – <i>several tests</i> , 22,000-23,900mg/kg (mouse), 22,000mg/kg (dog) 14,800 & 18,500mg/kg (rabbit), 18,900mg/kg (guinea pig) |
| LD ₅₀ (skin) | 20,800mg/kg (rabbit) |
| LC ₅₀ (inhalation) | not known |

12. ECOLOGICAL INFORMATION

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| Bioaccumulation | propylene glycol is not a bioaccumulator |
| Biodegradation | biodegrades readily & rapidly in the presence of oxygen; 55-75% in 5 days, 78-84% in 20 days; also 99% in 1-2 days (<i>2 tests</i>) – rapid biodegradation means no Chronic Aquatic Toxicity testing required |
| Abiotic Degradation | reacts with atmospheric hydroxyl radicals; estimated ½-life in air is 32hours |
| Mobility in soil, water | water soluble; moves readily in soil and water |
| Aquatic Toxicity | |
| LC ₅₀ (Fish, 96hr) | 23,800mg/litre (Cyprinodon variegatus), 51,600mg/litre (Oncorhynchus mykiss), 51,400 & 54,650mg/litre (Pimephelas promelas) |
| EC ₅₀ (Crustacea, 48hr) | 34,400 & 43,500mg/litre (Daphnia magna), 10,000mg/litre (Artemia salina, 24hr) |
| EC ₅₀ (Algae) | 19,000mg/litre (Selenastrum capricornutum), 19,100mg/litre (Skeletonema costatum) |
| NOAEC (Bacteria) | 20,000mg/litre – <i>NOAEC = No Observed Adverse Effect Concentration</i> |

13. DISPOSAL

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| Waste Disposal | do not flush to sewer , recycle if possible; mix with flammable waste & incinerate in approved facility |
| 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

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|------------------|---------------|--------------------------------|
| 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 |
| ERAP | | not required |

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14. TRANSPORT CLASSIFICATION, cont'd

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 |

This common substance is present on most national chemical inventories.

Europe Classification *not classified as hazardous in Europe*

U.S.A. Regulations:

Acceptable Daily Intakes: JECFA: ADI: 0 to 25 mg/kg bw

Allowable Tolerances: Residues of propylene glycol are exempted from the requirement of a tolerance when used 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. Use: solvent, cosolvent. Residues of propylene glycol are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals. Use: solvent, cosolvent.

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

State Drinking Water Standards: (NY) NEW YORK 1,000 ug/L

State Drinking Water Guidelines: New Hampshire 140,000 ug/ L

FIFRA Requirements: Residues of propylene glycol are exempted from the requirement of a tolerance when used 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. Use: solvent, cosolvent. Residues of propylene glycol are exempted from the requirement of a tolerance when used in accordance with good agricultural practice as inert (or occasionally active) ingredients in pesticide formulations applied to animals. Use: solvent, cosolvent. The Agency has completed its assessment of the dietary, drinking water, residential, ecological and occupational risks associated with the use of pesticide products containing the active ingredients propylene glycol and dipropylene glycol. Based on a review of these data, the Agency has sufficient information on the human health and ecological effects of propylene glycol and dipropylene glycol to make a decision as part of the tolerance reassessment process under FFDCFA and reregistration under FIFRA, as amended by FQPA. The Agency has determined that propylene glycol and dipropylene glycol containing products are eligible for reregistration. EPA has determined that the established exemption from a requirement for a tolerance for propylene glycol and dipropylene glycol, meet the safety standards under the FQPA amendments to section 408(b)(2)(C) of the FFDCFA, that there is a reasonable certainty of no harm for infants and children. ... In determining whether or not infants and children are particularly susceptible to toxic effects from propylene glycol and dipropylene glycol residues, the Agency considered the completeness of the database for developmental and reproductive effects, the nature of the effects observed, and other information. The FQPA Safety Factor has been removed (i.e., reduced to 1X) for propylene glycol and dipropylene glycol because there is no pre- or post-natal evidence for increased susceptibility following exposure. [REF-229] 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 newer health and safety data for pesticide active ingredients initially registered before November 1, 1984, and determines whether the use of the pesticide does not pose unreasonable risk in accordance to newer safety standards, such as those described in 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 than those on List C, and with List C containing pesticides of greater concern than those on List D. Propylene glycol is found on List C. Case No: 3126; Pesticide type: insecticide, fungicide, antimicrobial; Case Status: OPP is reviewing data from the pesticide's producers regarding its human health and/or environmental effects, or OPP is determining the pesticide's eligibility for reregistration and developing the Reregistration Eligibility Decision (RED) document.; Active ingredient (AI): Propylene glycol; Data Call-in (DCI) Date(s): 08/02/93; AI Status:

FDA Requirements: Substance added directly to human food affirmed as generally recognized as safe. Propylene glycol used as an emulsifying agent in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice. Propylene glycol used as a general purpose food additive in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice. Drug products containing certain active ingredients offered over-the-counter (OTC) for certain uses. A number of active ingredients have been present in OTC drug products for various uses, as described below. However, based on evidence currently available, there are inadequate data to establish general recognition of the safety and effectiveness of these ingredients for the specified uses: propylene glycol is included in pediculicide drug products. Ophthalmic demulcents. The active ingredients of the product consist of any of the following, within the established concentrations for each ingredient: Propylene glycol, 0.2 to 1 percent. The Food and Drug Administration has determined that propylene glycol in or on cat food is not generally recognized as safe and is a food additive subject to section 409 of the Federal Food, Drug, and Cosmetic Act (the act). The Food and Drug Administration also has determined that this use of propylene glycol is not prior sanctioned. The Food and Drug Administration has determined that propylene glycol in or on cat food has not been shown by adequate scientific data to be safe for use. Use of propylene glycol in or on cat food causes the feed to be adulterated and in violation of the Federal Food, Drug, and Cosmetic Act (the act), in the absence of a regulation providing for its safe use as a food additive under section 409 of the act, unless it is subject to an effective notice of claimed investigational exemption for a food additive under part 570.17 of this chapter, or unless the substance is intended for use as a new animal drug and is subject to an approved application under section 512 of the act or an effective notice of claimed investigational exemption for a new animal drug under part 511 of this chapter.

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.

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