

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Old World Industries, Inc.
4065 Commercial Avenue
Northbrook, IL 60062-1851
Phone: (847) 559-2000

Effective Date: 11/23/98
Revision: original
Last Updaed: n.a.
Emergency Phone: (800) 424-9300
[CHEMTREC]

PRODUCT: Propylene Glycol/Urea Runway Deicer Fluid

OLD WORLD INDUSTRIES NAME: ORD 2000

Chemical Name: Propylene Glycol
Urea
Chemical Family: Glycol
Urea
Synonyms: 1,2 Propanediol; Methyl Ethylene Glycol
Carbamide
Chemical Formula: $C_3H_8O_2$
 $CO(NH_2)_2$

2. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Ingredients</u>	<u>CAS No.</u>	<u>Wt %</u>
Propylene Glycol	57-55-6	50
Urea	57-13-6	20

Exposure Guidelines: OSHA STANDARDS - None established.
Guidelines:

ACGIH THRESHOLD LIMIT VALUES - None established.

AIHA WEEL: 50 ppm total, 10 mg/m³ aerosol only.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Liquid is irritating to eyes and skin. Ingestion of propylene glycol can result in mental sluggishness, followed by difficulty in breathing and heart failure, kidney and brain damage. Combustible liquid when exposed to heat or flame.

NFPA Ratings -	Key:
Health 0	0 - Minimal
Fire 1	1 - Slight
Reactivity 0	2 - Moderate
	3 - Serious
	4 - Severe

POTENTIAL HEALTH EFFECTS:

Target Organs: Central nervous system, skin, eyes, respiratory system, liver, kidneys.

Routes of Exposure: Ingestion, skin contact and absorption, eye contact, inhalation

Eyes:	Stinging and mild hyperemia have occurred with eye exposure.
Skin:	Essentially non-irritating. Prolonged contact may cause skin softening. Slightly toxic to animals by absorption.
Ingestion:	Considered relatively non toxic following acute ingestion, however, lactic acidosis, stupor, and seizures have been reported following chronic ingestion. Renal and hepatic toxicity have been noted in animals. Probable oral lethal dose for humans is above 15 g/kg; for 70 kg person (150 lb), more than 1 qt (2.2 lb).
Inhalation:	If inhaled, symptoms include general anesthetic effect, headache, coughing, nausea or vomiting.
Signs/Symptoms:	Overexposure to propylene glycol can cause CNS depression, malaise, dizziness, fatigue, and headache, liver or kidney injury, and death from anesthetic effects.
Chronic Effects:	Damage to liver, kidneys, lungs, blood, and central nervous system.

4. FIRST AID MEASURES

Ensure physician has access to this MSDS.

Eyes:	Immediately flush eyes with large amounts of water for 15 minutes, lifting lower and upper lids. Get medical attention as soon as possible. Contact lenses should never be worn when working with this chemical.
Skin:	Flush area of skin contact immediately with large amounts of water for at least 15 minutes while removing contaminated clothing. If irritation persists after flushing, get medical attention promptly. Wash clothing before re-use.
Inhalation:	If inhaled, immediately remove victim to fresh air and call emergency medical care . If not breathing, give artificial respiration. If breathing is difficult, give oxygen.
Ingestion:	If swallowed give two glasses of water and immediately call physician . Induce vomiting of conscious patient by pressing finger down throat. Small amounts entering mouth should be rinsed out for 5 minutes.

5. FIRE FIGHTING MEASURES

Flashpoint (OC):	none
Auto Ignition Temp:	none established
LEL:	2.6% by volume

UEL: 12.6% by volume
Sensitive to Mechanical Impact: No Static: No

Extinguishing Media: Alcohol foam, water, foam, carbon dioxide, or dry chemical

Special Procedures: Firefighters should wear proper protective equipment and self-contained breathing apparatus with full facepiece operated in positive pressure mode.

Explosion Hazards: For mist in air, moderate explosion hazard when exposed to flames.

Small Fire: Dry chemical, carbon dioxide or halon

Large Fires: Water spray, fog or standard foam is recommended. Cool containers that are exposed to flames with water from the side until well after fire is out. If the fire involves a tank car or truck, isolate the area for 1/2 mile in all directions. Stay away from ends of tanks

6. ACCIDENTAL RELEASE MEASURES

Large Spill: Wear self-contained breathing apparatus and full protective clothing. Stop leak if you can do so without risk. Ventilate area. Dike area if feasible. Take up with vermiculite, dry sand, or earth.

Small Spill: Use full protective clothing including high efficiency particulate respirator. Take up with vermiculite, dry sand, or earth.

7. HANDLING AND STORAGE

Keep containers tightly closed. Store in a cool, dry, well-ventilated location, away from strong oxidizers, potential fire hazards, and incompatible chemicals.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Respiratory Protection: Respiratory protection is required if airborne concentration exceeds TLV. At any detectable concentration, any self-contained breathing apparatus with a full facepiece and operated in a pressure-demand or other positive pressure mode or any supplied-air respirator with a full facepiece and operated in a pressure-demand or other positive pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive pressure mode.

Escape: Any air-purifying full facepiece respirator (gas mask) with a chin-style or front- or back-mounted organic vapor canister or any appropriate escape-type self-contained breathing apparatus.

Skin Protection:	Protective gloves recommended when prolonged skin contact can not be avoided. Safety shower should be available.
Eye Protection:	Safety goggles and face shield. Emergency eyewash should be available. Contact lenses should not be worn when working with this chemical.
Engineering Controls:	Use general or local exhaust ventilation to meet TLV requirements.
Special Precautions:	Trace quantities of propylene oxide (PO) may be present in this product. While these trace quantities could accumulate in the headspace areas of storage transport vessels, they are not expected to create a condition which will result in PO concentration greater than the OSHA established permissible exposure limit of 20 ppm (8 hour TWA) for PO.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance:	Colorless viscous liquid
Odor:	Slight ammonia odor
Physical State:	Liquid
Boiling Point:	188°C (370°F) @ 760 mm Hg
Freezing Point:	-59°C (-74.2°F)
Solubility:	Complete
% Volatiles:	50
Specific Gravity (H ₂ O=1):	1.09 @25°C (77°F)
Evaporation Rate:	Not available
Odor Threshold:	Not available
Oil/Water Coefficient:	Not available

10. STABILITY AND REACTIVITY

Stability:	Stable under normal conditions of use. Can react with oxidizing materials stable under ordinary conditions. Tends to oxidize at high temperatures.
Incompatibility:	Strong oxidizing agents and strong acids. May react with hydrofluoric acid + nitric acid + silver nitrate to form the explosive silver fulminate.
Hazardous Products Decomposition:	Acrid smoke and irritating fumes. Carbon monoxide and carbon dioxide may evolve.
Hazardous Polymerization:	Will not occur

11. TOXICOLOGICAL INFORMATION

Irritation data:	skin-human	500 mg/7D MILD
	skin-human	104 mg/3D MODERATE
	skin-man	10%/2D
	eye-rabbit	100 mg/24H MILD
Mutagenic Data:	DNA Inhibition System (mouse: subcutaneous) 8000 mg/kg	
	Cytogenetic Analysis (mouse: subcutaneous) 8000 mg/kg	
	Cytogenetic Analysis (hamster: fibroblast) 32 g/l	
Toxicity Data:	intraperitoneal-mouse	TDLo: 100 mg/kg
	oral-child	TDLo: 79 g/kg
	oral-rat	LD50: 20 g/kg
	intraperitoneal-rat	LD50: 6660 mg/kg
	subcutaneous-rat	LD50: 22500 mg/kg
	intravenous-rat	LD50: 6423 mg/kg
	intramuscular-rat	LD50: 14 g/kg
	oral-mouse	LD50: 22 g/kg
	intraperitoneal-mouse	LD50: 9718 mg.kg
	subcutaneous-mouse	LD50: 17370 mg/kg
	intravenous-mouse	LD50: 6630 mg/kg
Classification of carcinogenicity:	None	

12. ECOLOGICAL CONSIDERATIONS

Ecotoxicity Values:	No data available
Terrestrial Fate:	1,2-Propanediol has been shown to biodegrade readily by a number of biological screening studies, and is expected to biodegrade in soil. Based on its complete water solubility and log Kow (-0.92), 1,2-propanediol can be expected to be susceptible to significant leaching. However, concurrent biodegradation may proceed rapidly enough to diminish the importance of leaching. Evaporation from dry surfaces is likely to occur; however, volatilization from moist soils may not be significant.
Aquatic Fate:	Aquatic hydrolysis, oxidation, volatilization, bioconcentration, and adsorption to sediment are not expected to be significant fate processes. Therefore, when 1,2-propanediol is released to the aquatic environment, it is expected to be removed via biological processes.
Atmospheric Fate:	1,2-Propanediol is expected to exist almost entirely in the vapor-phase in the ambient atmosphere, based on a vapor pressure of 0.08 mm Hg at 20°C.

(1,2). It is degraded rapidly in the vapor-phase by reaction with photochemically produced hydroxyl radicals (estimated half-life of 32 hr in an average ambient atmosphere). The complete water solubility of 1,2-propanediol suggests that physical removal from the atmosphere via rainfall is possible. [(1) Weber RC et al; Vapor Pressure Distribution of Selected Organic Chemicals. USEPA-600/2-81-021 p. 28 (1981) (2) Eisenreich SJ et al; Environ Sci Technol 15: 30-8 (1981)]

Biodegradation:

Standard dilution BOD water, 5-day 64% Theoretical Biochemical Oxygen Demand, sewage inocula (1). Warburg respirometer, 40-day 78% Theoretical Biochemical Oxygen Demand, sewage inocula (2). Nutrient broth, 100% degradation in 4 days (aerobic conditions), 100% degradation in 4-9 days (anaerobic conditions), activated sludge or digester sludge inocula, no significant degradation in sterile controls (3). Standard dilution BOD water, 5-day 2.2% Theoretical Biochemical Oxygen Demand, 10-day 56.7% Theoretical Biochemical Oxygen Demand, 50-day 80% Theoretical Biochemical Oxygen Demand, sewage inocula (4). Standard dilution BOD water, 5-day 62% Theoretical Biochemical Oxygen Demand, 20-day 79% Theoretical Biochemical Oxygen Demand, sewage inocula (5); synthetic seawater dilution, 5-day 55% Theoretical Biochemical Oxygen Demand, 20-day 83% Theoretical Biochemical Oxygen Demand, raw wastewater inocula (5). Sewage die-away, 74.5% Theoretical Biochemical Oxygen Demand in 5 days (6). 1,2-Propanediol has been found to be degradable via anaerobic biotechnology (7,8). Wastewater treatment, 95% removal in 6 hr, activated sludge inocula (9). Standard dilution BOD water, 5-day 26.6% Theoretical Biochemical Oxygen Demand; seawater dilution, 5-day 59.5% Theoretical Biochemical Oxygen Demand (10). [(1) Bridie AL et al; Water Res 13: 627-30 (1979) (2) Helfgott TB et al; An Index of Refractory Organics. USEPA-66/2-77-174 (1977) (3) Kaplan DL et al; Environ Sci Technol 16: 723-5 (1982) (4) Lamb CB, Jenkins GF; p. 326-9 in Proc 8th Industrial Waste Conf, Purdue Univ (1952) (5) Price KS et al; J Water Pollut Control Fed 46: 63-77 (1974) (6) Wagner R; Vom Wasser 47: 241-65 (1976) (7) Chou WL et al; Biotechnol Bioeng Symp 8: 391-414 (1979) (7) Speece RE; Environ Sci Technol 17: 416A-427A (1983) (9) Grumwald A et al; Vodni Hospod 34: 247-52 (1984) (10) Takemoto S et al; Suishitsu Odaku Kenkyu 4: 80-90 (1981)]

Abiotic Degradation:

The experimentally determined rate constant for the vapor-phase reaction of 1,2-propanediol with photochemically produced hydroxyl radicals has been reported to be 12×10^{-12} cm³/molecule-sec at 22°C (1); the atmospheric half-life for this reaction can be estimated to be 32 hours, assuming an average atmospheric hydroxyl radical concentration of 5×10^5 molecules/cm³ (1). The rate constant for the reaction of 1,2-propanediol with hydroxyl radicals in aqueous solution is approximately $0.94-1.68 \times 10^9$ L/mol-sec (2); if the hydroxyl radical concentration of

sunlit natural water is assumed to be 1×10^{-17} moles/L (4), the half-life would be approximately 1.3-2.3 years. Glycols are generally resistant to aqueous hydrolysis in the environment(5). [(1) Atkinson RA; Chem Rev 85: 60-201 (1985) (2) Anbar M, Neta; Int J Appl Radiation and Isotopes 18: 493-523 (1967) (3) Dorfman LM, Adams GE; Reactivity of the Hydroxyl Radical in Aqueous Solution. NSRD-NBS-46, National Bureau of Standards (1973) (4) Mill T et al; Science 207: 886-7 (1980) (5) Lyman WJ et al; Handbook of Chemical Property Estimation Methods NY: McGraw-Hill p. 7-4 (1982)]

- Bioconcentration:** Based on a log Kow of -0.92 (1), the BCF for 1,2-propanediol can be estimated to be <1 from a recommended regression-derived equation (2). [(1) Hansch C, Leo AJ; Medchem Project Issue No 26. Clarmont CA: Pomona College (1985) (2) Lyman WJ et al; Handbook of Chemical Property Estimation Methods NY: McGraw-Hill p. 5-4 (1982)]
- Soil Adsorption/Mobility** 1,2-Propanediol is completely miscible in water and has a log Kow of -0.92 (1,2). These properties are indicative of very high mobility in soil. [(1) Merck Index; An Encyclopedia of Chemicals, Drugs and Biologicals 10th ed p. 1130-1 (1983) (2) Hansch C, Leo AJ; Medchem Project Issue No 26. Clarmont CA: Pomona College (1985)]
- Volatilization:** The Henry's Law Constant for 1,2-propanediol is approximately 1.2×10^{-8} atm m³/mole (1). This value of Henry's Law Constant indicates that 1,2-propanediol is essentially not volatile from water (2). [(1) Simmons P et al; p. 212-7 in Book Pap, Int Tech Conf. Research Triangle Park, NC: Amer Assoc Text (1976) (2) Lyman WJ et al; Handbook of Chemical Property Estimation Methods NY: McGraw-Hill p. 15-16 (1982)]

13. DISPOSAL CONSIDERATIONS

DO NOT discharge to sewer. Wear appropriate personal protection. Take up with sand, vermiculite, or similar inert material. Dispose in accordance with federal, state and local regulations.

14. TRANSPORT INFORMATION

Proper Shipping Name:	Propylene Glycol/Urea
ID No.:	Not regulated
Hazard Class:	Not regulated
Packaging Group:	Not regulated
Label:	Not regulated

15. REGULATORY INFORMATION

United States

TSCA - Inventory: Listed

Water Standards: Not regulated.

Atmospheric Standards: Not regulated.

CERCLA : Not regulated.

SARA Title III: Section 311/312 - Categories: Acute

Section 312 - Inventory Reporting: Propylene glycol is not subject to Tier I and/or Tier II annual inventory reporting.

Section 313 - Emission Reporting: Propylene glycol is not subject to Form R reporting requirements.

Section 302 - Extremely Hazardous Substances: Propylene glycol is not listed.

Other Regulations

California

Exposure Limits - Ceilings: not listed

Dir. List of Haz. Substances: not listed

Florida

Hazardous Substances List: not listed

Massachusetts

Right-to-Know List: not listed

Minnesota

Haz. Subs. List: listed

New Jersey

Right-to-Know List (Total): not listed

Pennsylvania

Right-to-Know List: listed

Michigan

Critical Materials List: not listed

Canada

WHMIS: 1% on Ingredient Disclosure List - item 1362 (1454),
not regulated

16. OTHER INFORMATION

Contact: Karen Engelbrecht

Phone: (847) 559-2000

Old World Industries, Inc. makes no warranty, representation or guarantee as to the accuracy, sufficiency or completeness of the material set forth herein. It is the user's responsibility to determine the safety, toxicity and suitability of his own use, handling and disposal of this product. Since actual use by others is beyond our control, no warranty, expressed or implied, is made by Old World Industries, Inc. as to the effects of such use, the results to be obtained or the safety and toxicity of this product, nor does Old World Industries, Inc. assume liability arising out of the use by others of this product referred to herein. The data in this MSDS relates only to the specific material designated herein and does not relate to use in combination with any other materials or in any process.

