PROPYLENE GLYCOL INDUSTRIAL

SECTION 1: IDENTIFICATION

Product Name: PROPYLENE GLYCOL INDUSTRIAL

Product Number: 000000000000499202

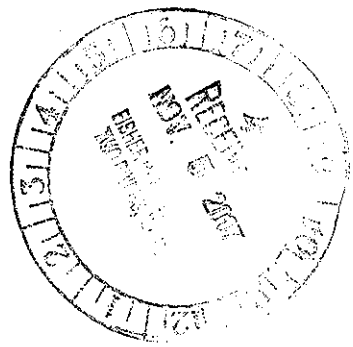
Internal ID: 243, 293

Chemical Family: Glycols

CAS Number: 57-55-6

Chemical Name: 1,2-Propanediol

Synonyms: Propylene Glycol, 1,2-Propanediol, 1,2-Dihydroxypropane, Monopropylene Glycol



Manufacturer
Lyondell Chemical Company
One Houston Center, Suite 1600
1221 McKinney St.
P.O. Box 2583
Houston Texas 77252-2583

Business Contact
Customer Service 888 777-0232
Product Safety 800 700-0946

24 Hour Emergency Contact
CHEMTREC 800 424-9300
LYONDELL 800-245-4532

SECTION 2 : COMPOSITION/INFORMATION ON INGREDIENTS

Component Name	CAS #	EU Inventory	Concentration Wt.%*	Risk	Symbol
Propylene Glycol	57-55-6	200-338-0	> 99.0	None	None

* Concentration of gaseous products or materials is given in Mole %

Compositions given are typical values not specifications.

SECTION 3: HAZARD IDENTIFICATION

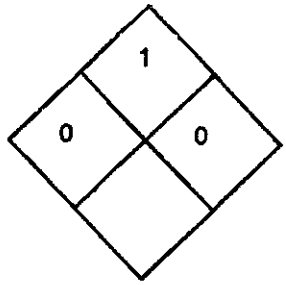
Emergency Overview
This material is NOT HAZARDOUS by OSHA Hazard Communication definition.

Signal Word
Caution.

Hazards
Slightly combustible liquid. Do not handle near heat, sparks, or open flame. May cause minor eye irritation. High aerosol concentrations may cause mild irritation of the nose and throat as well as central nervous system depression. Not expected to cause skin irritation. Not expected to be a sensitizer.

PROPYLENE GLYCOL INDUSTRIAL

NFPA®



HMIS®

Health	1
Flammability	1
Reactivity	0

Physical State
Liquid.

Color
Clear, colorless.

Odor
Little or no odor.

Odor Threshold
No value available.

Potential Health Effects

Routes of Exposure
Eye Skin. Inhalation

Signs and Symptoms of Acute Exposure
See component summary.

- *Propylene Glycol 57-55-6*

May cause minor eye irritation. High aerosol concentrations may cause mild irritation of the nose and throat as well as central nervous system depression.

Skin
Not a skin irritant. Not expected to be a sensitizer.

Inhalation
High aerosol concentrations may cause mild reversible irritation of the nose and throat as well as CNS depression (primarily fatigue, dizziness and possibly loss of concentration, with collapse, coma and death possible in cases of severe over exposure).

Eye
May cause minor eye irritation. Effects of eye irritation are reversible.

Ingestion
Ingestion of high doses may cause discomfort and irritation of the gastrointestinal tract and CNS depression (fatigue, dizziness and possibly loss of concentration, with collapse, coma and death in cases of severe over-exposure).

Chronic Health Effects
See component summary.

- *Propylene Glycol 57-55-6*

Repeated or prolonged exposure of the skin to this material may cause defatting and drying of the skin. Prolonged or repeated breathing of high concentrations may cause symptoms of central nervous system depression.

Conditions Aggravated by Exposure
This material or its emissions may aggravate pre-existing eye disease.

SECTION 4: FIRST AID MEASURES

General
After adequate first aid, no further treatment is required unless symptoms reappear.

Skin
Not expected to present a significant skin hazard under anticipated conditions of normal use. If skin contact occurs, remove contaminated clothing and wash skin thoroughly.

Inhalation
Not expected to present a significant inhalation hazard under anticipated conditions of normal use. If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain medical attention if breathing difficulty persists.

Eye
Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

Ingestion
Ingestion unlikely. If large quantity swallowed, give lukewarm water (pint/ 1/2 litre) if victim completely conscious/alert. Obtain medical attention.

Note to Physician
Treat symptomatically. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

SECTION 5: FIRE FIGHTING MEASURES

Flammable Properties

Classification
OSHA/NFPA Class IIIB combustible liquid.

Flash Point:
~ 109 °C (228.2 °F) (PMCC) (Aqueous solution).

Auto-Ignition Temperature
~ 371 °C (699.8 °F)

Lower Flammable Limit
~ 2.4 vol%

Upper Flammable Limit
~ 17.4 vol%

Extinguishing Media

Suitable: SMALL FIRE: Use dry chemicals, CO2, water spray or alcohol-resistant foam. LARGE FIRE: Use water spray, water fog or alcohol-resistant foam.

Unsuitable: Do not use solid water stream.

Protection of Firefighters

Protective Equipment/Clothing: Wear positive pressure self-contained breathing apparatus (SCBA). Structural firefighters protective clothing will only provide limited protection.

Fire Fighting Guidance: Heat from fire can generate flammable vapor. When mixed with air and exposed to ignition source, vapors can burn in open or explode if confined. May travel long distances along the ground before igniting and flashing back to vapor source. Fine sprays/mists may be combustible at temperatures below normal flash point. Aqueous solutions containing less than 95% propylene glycol by weight have no flash point as obtained by standard test methods. However aqueous solutions of propylene glycol greater than 22% by weight, if heated sufficiently, will produce flammable vapors. Always drain and flush systems containing propylene glycol with water before welding or other maintenance. Refer to NFPA Code 13 for guidance in using propylene glycol in sprinkler system applications. Move containers from fire area if you can do it without risk. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Hazardous Combustion Products: Incomplete combustion may produce carbon monoxide and other toxic gases.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Release Response
In case of accidental spill, may contaminate water supplies/pollute public waters. Evacuate/limit access. Equip responders with proper protection. Extinguish ignition sources; stop release; prevent flow to sewers or public waters. Notify fire and environmental authorities. Restrict water use for cleanup. Slippery walking/spread granular cover or soak up. Impound/recover large land spill; soak up small spill with inert solids. Use suitable disposal containers. On water, material is soluble and will disperse rapidly unless contained and collected quickly to minimize dispersion. Report per regulatory requirements.

SECTION 7: HANDLING AND STORAGE

Handling
Hygroscopic. Handle with care. After handling, always wash hands thoroughly with soap and water. Always drain and flush systems containing propylene glycol with water before welding or other maintenance. Wear recommended personal protective equipment. Observe precautions pertaining to confined space entry.

Storage
Hygroscopic. Keep drums tightly closed to prevent contamination. Store away from heat, sparks, open flames, strong oxidizing agents and direct sunlight. Store at 65-90°F (18-32°C). Stainless steel containers. Lined steel. Mild steel. Reinforced plastic. Use dry nitrogen or low dew point air for tank padding.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls
No special ventilation is recommended under anticipated conditions of normal use beyond that needed for normal comfort control.

Personal Protection
Inhalation No special respiratory protection is recommended under anticipated conditions of normal use with adequate ventilation. A respiratory protection program that meets OSHA's 29 CFR 1910.134 or ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use.

Skin Wear chemical resistant gloves such as: Neoprene. Where use can result in skin contact, practice good personal hygiene. The equipment must be cleaned thoroughly after each use.

Eye Use splash goggles when eye contact due to splashing or spraying liquid is possible.

Additional Remarks
Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing/wash thoroughly before reuse.

Occupational Exposure Limits

Component Name	Source / Date	Value	Type	Notation
Propylene Glycol	US (ACGIH) / 2003	N/L		
	US (OSHA) / 2003	N/L		

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid. Clear, colorless.

Odor: Little or no odor.

Odor Threshold: No value available.

pH: ~ 7

Boiling Point/Boiling Range: ~ 188 °C (370.4 °F) @ 760 mm Hg

Freezing Point/Melting Point: ~ -60 °C (-76 °F)

Flash Point: ~ 109 °C (228.2 °F) (PMCC) (Aqueous solution).

Auto-Ignition: ~ 371 °C (699.8 °F)

Flammability: OSHA/NFPA Class IIIB combustible liquid.

Lower Flammable Limit: ~ 2.4 vol%

Upper Flammable Limit: ~ 17.4 vol%

Explosive Properties: No Data Available.

Oxidizing Properties: No Data Available.

Vapor Pressure: < 0.1 mm Hg @ 25 °C (77 °F)

Evaporation Rate: 0.01 (butyl acetate = 1)

Relative Density: ~ 1.04 @ 25 °C (77 °F)

Relative Vapor Density: ~ 2.6 @ ~ 15 - 32 °C (59 - 89.6 °F) (Air = 1.0)

Viscosity: ~ 46 mPa.s @ 25 °C (77 °F) (Brookfield).

Solubility (Water): Complete (In All Proportions).

Partition Coefficient (Kow): ~ -0.92

Additional Physical and Chemical Properties: Volatile Characteristics: Slight: 0.1 to 1.0% Hygroscopic. Additional properties may be listed in Sections 3 and 5.

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability
This material is stable when properly handled and stored.

Conditions to Avoid
High temperatures, oxidizing conditions. May degrade when exposed to light or other radiation sources.

Substances to Avoid
Reacts with strong oxidizing agents. Strong acids. Isocyanates.

Decomposition Products
Carbon Monoxide and other toxic vapors.

Hazardous Polymerization
Not expected to occur.

Reactions with Air and Water
Not expected to occur.

SECTION 11: TOXICOLOGICAL INFORMATION

PRODUCT INFORMATION

Product Summary
No additional toxicology information is available for this product itself. (See Component Toxicity Information).

Irritation
Eye May cause minor eye irritation. Effects of eye irritation are reversible.

Sensitization
Not expected to cause sensitization by skin contact, however skin reactions of unknown etiology have been described in some hypersensitive individuals following topical application.

Repeated Dose Toxicity
No adverse systemic changes were reported in rats or dogs following repeated dietary exposure to high concentrations of propylene glycol. Cats responded with species-specific hematological changes (Heinz body formation) yet all other tissues were unaffected. No systemic effects, but mild eye and nasal irritation were noted in rats following sub-chronic exposure to high concentrations of propylene glycol aerosol. Overall propylene glycol is of low inherent toxicity following repeated oral or inhalation exposure.

Reproductive Effects
No adverse effect on reproductive performance was seen in male and female mice exposed continuously to high doses of propylene glycol in drinking water for up to 3 months.

Developmental Effects
Results from studies in pregnant rats, mice, hamsters and rabbits demonstrate that propylene glycol is not teratogenic or fetotoxic.

Genetic Toxicity
Negative for genotoxicity both in vitro and in vivo tests.

Carcinogenicity
No increase in tumors was noted in rats and dogs exposed to high concentrations of propylene glycol via the diet for up to 2 years. The incidence of skin tumors was unaltered in mice following dermal application over a lifetime. Not listed by IARC, NTP, or OSHA.

COMPONENT INFORMATION

- *Propylene Glycol 57-55-6*

Acute Toxicity - Lethal Doses

LD50 (Oral)	Rat	22,000 MG/KG

LD50 (Skin) Rabbit. 20,800 MG/KG

Irritation
Skin Not a skin irritant. Repeated or prolonged contact with skin may cause dermatitis.

Eye May cause minor eye irritation. Effects of eye irritation are reversible.

Sensitization
Not expected to cause sensitization by skin contact, however skin reactions of unknown etiology have been described in some hypersensitive individuals following topical application.

Target Organ Effects
Skin. Repeated or prolonged contact with skin may cause defatting and drying of the skin which may result in dermatitis.

Repeated Dose Toxicity
No adverse systemic changes were reported in rats or dogs following repeated dietary exposure to high concentrations of propylene glycol. Cats responded with species-specific hematological changes (Heinz body formation) yet all other tissues were unaffected. No systemic effects, but mild eye and nasal irritation were noted in rats following sub-chronic exposure to high concentrations of propylene glycol aerosol. Overall propylene glycol is of low inherent toxicity following repeated oral or inhalation exposure.

Reproductive Effects
No adverse effect on reproductive performance was seen in male and female mice exposed continuously to high doses of propylene glycol in drinking water for up to 3 months.

Developmental Effects
Results from studies in pregnant rats, mice, hamsters and rabbits demonstrate that propylene glycol is not teratogenic or fetotoxic.

Genetic Toxicity
Negative for genotoxicity both in vitro and in vivo tests.

Carcinogenicity
No increase in tumors was noted in rats and dogs exposed to high concentrations of propylene glycol via the diet for up to 2 years. The incidence of skin tumors was unaltered in mice following dermal application over a lifetime. Not listed by IARC, NTP, or OSHA.

SECTION 12: ECOLOGICAL INFORMATION

PRODUCT INFORMATION

Ecotoxicity

This material is expected to be non-hazardous to aquatic species.

Acute toxicity to fish
LC50 / 96 HOURS sheepshead minnow. 23,800 mg/l

Acute toxicity to aquatic invertebrates
EC50 / 48 HOURS daphnia > 43,500 mg/l

Toxicity to aquatic plants
EC50 / 72 HOURS green algae. > 19,000 mg/l

Toxicity to microorganisms

Summary: No Data Available.

Chronic toxicity to fish

Summary: No Data Available.

Chronic toxicity to aquatic invertebrates
IC25 / waterflea. 13,470 mg/l
Summary: A three generation reproductive study.

Environmental Fate and Pathway

Mobility
Transport between environmental compartments: Environmental releases of propylene glycol will tend to partition to water and soil, with little potential for evaporation.

Persistance and Degradability
Biodegradation: Readily biodegradable in aerobic conditions. There is evidence that it is degraded under anaerobic conditions.

Bioaccumulation: This material is not expected to bioaccumulate. BCF < 1.5

Other Adverse Effects
No additional information available.

COMPONENT INFORMATION

- *Propylene Glycol 57-55-6*

Ecotoxicity

This material is expected to be non-hazardous to aquatic species.

Acute toxicity to fish
LC50 / 96 HOUR fathead minnow 51,400 mg/l

LC50 / 96 HOUR salmon 51,600 mg/l

Acute toxicity to aquatic invertebrates
EC50 / 48 HOUR Daphnia magna. 43,500 mg/l

EC50 / 48 HOUR saltwater mysid. 27,300 mg/l

Toxicity to aquatic plants
EC50 / 72 HOUR Freshwater Algae. 24,200 mg/l

EC50 / 72 HOUR Marine algae 19,300 mg/l

Toxicity to microorganisms

Summary: No Data Available.

Chronic toxicity to fish

Summary: No Data Available.

Chronic toxicity to aquatic invertebrates
IC25 / waterflea. 13,470 mg/l
Summary: A three generation reproductive study.

Environmental Fate and Pathway

Mobility
Transport between environmental compartments: Environmental releases of propylene glycol will tend to partition to water and soil, with little potential for evaporation.

Persistance and Degradability
Biodegradation: Readily biodegradable in aerobic conditions. There is evidence that it is degraded under anaerobic conditions.

Bioaccumulation: This material is not expected to bioaccumulate. BCF < 1.5

Other Adverse Effects
No additional information available.

SECTION 13: DISPOSAL CONSIDERATIONS

Comply with federal, state, and local regulations for disposal. Landfill solids at permitted sites. Burn concentrated liquids, diluting with clean, low viscosity fuel. Avoid flameouts and assure that emissions comply with all applicable standards/regulations. Dilute aqueous waste may biodegrade. Avoid overloading/poisoning plant biomass. Assure effluent complies with applicable regulations.

SECTION 14: TRANSPORT INFORMATION

Proper Shipping Name

NON_REG PROPYLENE GLYCOL

SECTION 15: REGULATORY INFORMATION

Regulatory Status

Country	Inventory	
Australia	AICS	X
Canada	DSL	X
Canada	NDSL	
China	IECS	X
European Union	EINECS	X
European Union	ELINCS	
European Union	NLP	
Japan	ENCS	X
Korea	ECL	X
Philippines	PICCS	X
United States	TSCA	X

X = All components are included or are otherwise exempt from inclusion on this inventory.

C = Contact Lyondell/Equistar by e-mail at product.safety@lyondell.com or product.safety@equistarchem.com for additional information.

If identified components of this product are listed under the TSCA 12(b) Export Notification rule, they will be listed below.

SARA 302/304

Chemicals with provided CAS numbers in this material are not subject to the reporting requirements of CERCLA.

SARA 311/312

Based upon available information, this material is not classified as a health and/or physical hazard according to Section 311 & 312.

SARA 313

This material does not contain any chemical components with known CAS numbers that exceed the De Minimis reporting levels established by SARA Title III, Section 313 and 40 CFR 372.

Component	Reporting Threshold

State Reporting

This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins under California Proposition 65 at levels which would be subject to the proposition.

Massachusetts Substances List (MSL) - Extraordinarily hazardous substances must be identified when present in materials at levels greater than state specified criterion. The criterion is >= 0.0001%. Hazardous Substances (MSL-HS) on the MSL must be identified when present in materials at greater than the state specified criterion. The criterion is >= 1%. Components with CAS numbers present in this material, at levels specified in Section 2 - Composition do not require reporting under the statute.

Hazardous Substances listed by the State of Pennsylvania must be identified when present in materials at levels greater than the state specified criterion. The criterion is >= 1%. Components with CAS numbers in this material at a level which could require reporting under the statute are:

- Propylene Glycol / CAS# 57-55-6.

Special Hazardous Substances listed by the State of Pennsylvania must be identified when present in materials at levels greater than the state specified criterion. The criterion is >= 0.01%. Components with CAS numbers present in this material, at levels specified in Section 2 - Components, do not require reporting under the statute.

SECTION 16: OTHER INFORMATION

Latest Revision(s)
Revised Section(s): 15 Date of Revision: 28 January 2002

DISCLAIMER OF RESPONSIBILITY

This document is generated for the purpose of distributing health, safety, and environmental data. It is not a specification sheet nor should any displayed data be construed as a specification. The information on this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable.

Numerical Data Presentation
The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example, 1,234.56 mg/kg = 1 234,56 mg/kg

Language Translations
The information presented in this document has been translated from English by a vendor Lyondell believes to be reliable. Lyondell and its vendor have made a good-faith effort to verify the accuracy of the translation, but assume no responsibility for any errors that may have occurred. Please refer to our web sites (www.lyondell.com and www.equistarchem.com) for