Brenntag Canada Inc.

MATERIAL SAFETY DATA SHEET

PROPYLENE GLYCOL (ALL GRADES)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Brenntag Canada Inc.
43 Jutland Rd.
Toronto, ON
M8Z 2G6
(416) 259-8231

Website: http:\\www.brenntag.ca

WHMIS#:	00060619
Index:	GCD1351/07A
Effective Date:	2007 March 14
Date of Revision:	2007 March 14

EMERGENCY TELEPHONE NUMBERS (FOR EMERGENCIES INVOLVING CHEMICAL SPILLS OR RELEASE)

Toronto, ON (416) 226-6117	Montreal, QC (514) 861-1211	Winnipeg, MB (204) 943-8827
Edmonton, AB (780) 424-1754	Calgary, AB (403) 263-8660	Vancouver, BC (604) 685-5036

PRODUCT IDENTIFICATION

Product Name:	Propylene Glycol (All Grades).
Chemical Name:	1,2-Propanediol.
Synonyms:	Propylene Glycol 95 - 100 % (Technical grade & USP); Propylene Glycol 40 - 60 %; 1,2-Dihydroxypropane; Methylethylene Glycol; Monopropylene Glycol; Propane-1,2-diol; alpha-Propyleneglycol; 1,2-Proppylene Glycol; Propylene Glycol USP.
Chemical Family:	Glycols.
Molecular Formula:	C3H8O2.
Product Use:	Food additive. Pharmaceutical. Automotive coolant/antifreeze. Solvent used in paints and coating products. Glycols are not intended for the production of theatrical fog or artificial smoke. The normal use of ethylene glycols in the workplace usually includes preventative measures to reduce or minimize personnel contact. Such measures may not be consistent with theatrical or entertainment settings where these special effects may be produced.

WHMIS Classification / Symbol:

Not regulated.

READ THE ENTIRE MSDS FOR THE COMPLETE HAZARD EVALUATION OF THIS PRODUCT.

2. COMPOSITION, INFORMATION ON INGREDIENTS (Not Intended As Specifications)

Ingredient	*CAS#*	*ACGIH TLV*	*% Concentration*
Propylene Glycol	57-55-6	---	40 - 100

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:	Low hazard for usual industrial or commercial handling. Can decompose at high temperatures forming toxic gases. Contents may develop pressure on prolonged exposure to heat.
POTENTIAL HEALTH EFFECTS	
Inhalation:	This product has a low vapour pressure and is not expected to present an inhalation hazard at ambient conditions. Prevent aerosolization or misting of this product. (3) See "Other Health Effects" Section.
Skin Contact:	This product is non-irritating upon contact. Prolonged, confined (especially under the finger nails, under rings or watch bands) or repeated exposure may cause skin irritation.
Skin Absorption:	A single, prolonged skin exposure is not likely to result in the absorption of toxic amounts of the material.

Eye Contact:	This product may cause mild, transient irritation. May cause blurred vision.
Ingestion:	This product may cause mild gastrointestinal discomfort.
Other Health Effects:	Effects (irritancy) on the skin and eyes may be delayed. Strict adherence to first aid measures following any exposure is essential. May cause hypoglycemia, liver damage, kidney damage and central nervous system (CNS) depression. CNS depression is characterized by headache, dizziness, drowsiness, nausea, vomiting and incoordination. Severe overexposures may lead to coma and possible death due to respiratory failure. Hypoglycemia is defined as an abnormally low concentration of glucose in the circulating blood. (6) Liver damage is characterized by the loss of appetite, jaundice (yellowish skin colour), and occasional pain in the upper left-hand side of the abdomen. Signs and symptoms of kidney damage generally progress from oliguria, to blood in the urine, to total renal failure.

4. FIRST AID MEASURES

FIRST AID PROCEDURES

Inhalation:	If respiratory problems arise, move the victim to fresh air. Give artificial respiration ONLY if breathing has stopped. Give cardiopulmonary resuscitation (CPR) if there is no breathing AND no pulse. Obtain medical advice IMMEDIATELY.
Skin Contact:	Start flushing while removing contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation, redness, or a burning sensation develops and persists, obtain medical advice.
Eye Contact:	Immediately flush eyes thoroughly for 5 minutes with running water. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention.
Ingestion:	Do not attempt to give anything by mouth to an unconscious person. If victim is alert and not convulsing, rinse mouth out and give 1/2 to 1 glass of water to dilute material. DO NOT induce vomiting. If spontaneous vomiting occurs, have victim lean forward with head down to avoid breathing in of vomitus, rinse mouth and administer more water. Obtain medical attention IMMEDIATELY.
Note to Physicians:	This product contains materials that may cause severe pneumonitis if aspirated. If ingestion has occurred less than 2 hours earlier, carry out careful gastric lavage; use endotracheal cuff if available, to prevent aspiration. Observe patient for respiratory difficulty from aspiration pneumonitis. Give artificial resuscitation and appropriate chemotherapy if respiration is depressed. Medical conditions that may be aggravated by exposure to this product include neurological and cardiovascular disorders, diseases of the skin, eyes or respiratory tract, preexisting liver and kidney disorders.

5. FIRE-FIGHTING MEASURES

Flashpoint (°C)	***AutoIgnition Temperature (°C)***	**Flammability Limits in Air (%):** ***LEL***	***UEL***
99 - 109 (3)	371 - 421. (3)	2.4. (3)	17.4. (3)

Flammability Class (WHMIS):	Not regulated.
Hazardous Combustion Products:	Thermal decomposition products are toxic and may include oxides of carbon and irritating gases.
Unusual Fire or Explosion Hazards:	Do not direct a solid stream of foam into hot, burning pools. This may cause spattering and increase fire intensity. Closed containers exposed to heat may burst. Spilled material may cause floors and contact surfaces to become slippery. Aqueous solutions containing less than 95 % Propylene Glycol by weight have no flash points as obtained by standard test methods. However, aqueous solutions of Propylene Glycol greater than 22 % by weight, if heated sufficiently, will produce flammable vapours. Only aqueous solutions of Propylene Glycol less than 22 % by weight should be used in sprinkler systems or other fire-fighting equipment. (3)
Sensitivity to Mechanical Impact:	Not expected to be sensitive to mechanical impact.
Rate of Burning:	Not available.
Explosive Power:	Not available.
Sensitivity to Static Discharge:	Not expected to be sensitive to static discharge.

EXTINGUISHING MEDIA

Fire Extinguishing Media:	Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog. Do not use high volume water jet.
FIRE FIGHTING INSTRUCTIONS	
Instructions to the Fire Fighters:	Use water spray to cool fire-exposed containers or structures. Use water spray to disperse vapours. Isolate materials that are not involved in the fire and protect personnel. Cool containers with flooding quantities of water until well after the fire is out. Spilled material may cause floors and contact surfaces to become slippery.
Fire Fighting Protective Equipment:	Use self-contained breathing apparatus and protective clothing.

6. ACCIDENTAL RELEASE MEASURES

Information in this section is for responding to spills, leaks or releases in order to prevent or minimize the adverse effects on persons, property and the environment. There may be specific reporting requirements associated with spills, leaks or releases, which change from region to region.

Containment and Clean-Up Procedures:	Wear protective clothing. Collect product for recovery or disposal. For release to land, or storm water runoff, contain discharge by constructing dykes or applying inert absorbent; for release to water, utilize damming and/or water diversion to minimize the spread of contamination. Ventilate enclosed spaces. Notify applicable government authority if release is reportable or could adversely affect the environment. Spilled material may cause floors and contact surfaces to become slippery.

7. HANDLING AND STORAGE

HANDLING

Handling Practices:	Use normal "good" industrial hygiene and housekeeping practices. Containers exposed to heat may be under internal pressure. These should be cooled and carefully vented before opening. A face shield and apron should be worn. Vent container frequently, and more often in warm weather, to relieve pressure.
Ventilation Requirements:	See Section 8, "Engineering Controls".
Other Precautions:	Use only with adequate ventilation and avoid breathing aerosols (vapours or mists). Avoid contact with eyes, skin or clothing. Wash thoroughly with soap and water after handling. Wash contaminated clothing thoroughly before re-use. Do not use cutting or welding torches on empty drums that contained this material/product.

STORAGE

Storage Temperature (°C):	Ideal storage temperature is 18 to 32. The typical shelf life of this product is 6 months. (3)
Ventilation Requirements:	General exhaust is acceptable.
Storage Requirements:	Store in a cool, well-ventilated area. Keep away from heat, sparks and flames. Keep containers closed. Do not expose sealed containers to temperatures above 40° C. Protect from direct sunlight. Avoid moisture contamination. Hygroscopic. Protect against physical damage. Store under inert gas (nitrogen). Once container is open, use nitrogen blanket on material and reseal. (3)
Special Materials to be Used for Packaging or Containers:	Materials of construction for storing the product include: mild steel or stainless steel. Equipment for storage, handling or transport should NOT be made from the following material, or, where applicable, its alloys: copper and zinc. Confirm suitability of any material before using.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Recommendations listed in this section indicate the type of equipment, which will provide protection against overexposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

ENGINEERING CONTROLS

Engineering Controls:	General exhaust is acceptable. Local exhaust ventilation preferred. Make up air should be supplied to balance air that is removed by local or general exhaust ventilation. Ventilate low lying areas such as sumps or pits where dense vapours may collect.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

Eye Protection:	Safety glasses with side shields are recommended to prevent eye contact. Use chemical safety goggles when there is potential for eye contact. Contact lenses should not be worn when working with this material.

Skin Protection:	Gloves and protective clothing made from neoprene, PVC, nitrile rubber and butyl rubber should be impervious under conditions of use. Prior to use, user should confirm impermeability. Discard contaminated gloves.
Respiratory Protection:	No specific guidelines available. Respiratory protection should not be necessary unless the material is heated or a mist created. A NIOSH/MSHA-approved air-purifying respirator equipped with organic vapour cartridges for concentrations up to 1 000 ppm organic vapours. An air-supplied respirator if concentrations are higher or unknown. If while wearing a respiratory protection, you can smell, taste or otherwise detect anything unusual, or in the case of a full facepiece respirator you experience eye irritation, leave the area immediately. Check to make sure the respirator to face seal is still good. If it is, replace the filter, cartridge or canister. If the seal is no longer good, you may need a new respirator. (4)
Other Personal Protective Equipment:	Wear regular work clothing. The use of coveralls is recommended. Locate safety shower and eyewash station close to chemical handling area. Take all precautions to avoid personal contact.

EXPOSURE GUIDELINES

None established for this product.

9. PHYSICAL AND CHEMICAL PROPERTIES (Not intended as Specifications)

Physical State:	Liquid.
Appearance:	Clear, colourless liquid.
Odour:	Mild glycol odour.
Odour Threshold (ppm):	Not applicable.
Boiling Range (°C):	186 - 189. (3)
Melting/Freezing Point (°C):	- 60. (3)
Vapour Pressure (mm Hg at 20° C):	0.07 - 0.20. (3)
Vapour Density (Air = 1.0):	2.5 - 2.6. (3)
Relative Density (g/cc):	1.03 - 1.04. (3)
Bulk Density:	1 030 - 1 040 kg/m3.
Viscosity:	55 mPa.s @ 20 °C. (3)
Evaporation Rate (Butyl Acetate = 1.0):	0.005.
Solubility:	Soluble in water. Hygroscopic.
% Volatile by Volume:	100.
pH:	6 - 7. (3)
Coefficient of Water/Oil Distribution:	< 0.
Volatile Organic Compounds (VOC):	28 % (ASTM D 2369) (3)

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions:	Stable.
Under Fire Conditions:	Not flammable.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures, sparks, open flames and all other sources of ignition. Temperatures above 40 °C (104 °F). Avoid moisture contamination. Hygroscopic.
Materials to Avoid:	Strong oxidizers. Strong acids. Isocyanates.
Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include oxides of carbon and irritating gases.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	***LD50 (Oral, Rat)***	***LD50 (Dermal, Rabbit)***	***LC50 (Inhalation, Rat, 4h)***

Propylene Glycol	20 000 mg/kg (1)	20 8000 mg/kg (1)	---

Carcinogenicity Data: The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP. See "Other Studies Relevant to Material".

Reproductive Data: No adverse reproductive effects are anticipated. See "Other Studies Relevant to Material".

Mutagenicity Data: No adverse mutagenic effects are anticipated. See "Other Studies Relevant to Material".

Teratogenicity Data: No adverse teratogenic effects are anticipated.

Respiratory / Skin Sensitization Data: None known.

Synergistic Materials: None known.

Other Studies Relevant to Material: Propylene Glycol, when tested by open and occluded patch tests, was found to be non-irritating to the skin of humans and animals. Slight irritation was noted when Propylene Glycol was administered to the eye. The irritation was non injurious and lasted until tears washed the Propylene Glycol away. (4)

Propylene Glycol has altered the intraocular osmotic blood pressure in both humans and rabbits when administered orally. Central nervous system depression, liver changes, kidney changes and some cardiovascular depression were observed following intravenous or oral administration of Propylene Glycol to rats, mice and calves. (4)

Animal studies for reproductive effects have shown damage to spermatocytes in mice. Reduced litter size, weights and appetite were also observed in rats administered Propylene Glycol (greater than 7.5 %) in their diets. (4)

Propylene Glycol was not mutagenic in bacteria. Chromosomal damage in mammalian cell lines and rat spermatocytes were also observed following administration of Propylene Glycol. (4)

12. ECOLOGICAL INFORMATION

Ecotoxicity: May be harmful to aquatic life at high concentrations.

48-hour EC50 (Daphnia) = Above 43, 500 mg/L (3)
96-hour LC50 (Sheepshead Minnow) = 23, 800 mg/L (3)

Environmental Fate: May be harmful if allowed to enter drinking water intakes. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers.

Propylene Glycol:
Biological Oxygen Demand (BOD) = 2.2 - 64 % (Theoretical, 5 Days) (4)
Biological Oxygen Demand (BOD) = 56.7 % (Theoretical, 10 days) (4)
Biological Oxygen Demand (BOD) = 79 % (Theoretical, 20 days) (4)
Biological Oxygen Demand (BOD) = 80 % (Theoretcial, 50 days) (4)

This product is estimated to have a moderate (Greater than 30%) rate of biodegradation in a test for ready biodegradation. (3)

This material is not expected to bioaccumulate. (3)

Propylene Glycol rapidly degrades to CO2 in soil without any lag time. Degradation does not appear to be inhibited by high glycol concentrations and proceeds, although at lower rates, at subfreezing temperatures. Mean degradation in soil microsomes were 83.5, 22.7 and 2.3 mg/Kg of soil per day at 25, 8 and -2 Degrees Celsius respectively. Based on its aqueous miscibility and Log Kow (-0.92), Propylene Glycol can be expected to be susceptible to leaching. Evaporation from dry surfaces is likely to occur; however, volatilization from moist solids myt not be significant. (4)

Propylene Glycol has been shown to biodegrade readily in a number of biological screening studies. Aquatic hydrolysis, oxidation, volatilization, bioconcentration and adsorption to sediment are not expected to be significant fate process because of its high water solubility and lack of hydrolyzable or oxidizable groups. Therefore, when Propylene Glycol is released to the aquatic environment, it is expected to be removed by biological processes. (4)

Propylene Glycol is expected to exist almost entirely in the vapour phase in the ambient atmosphere, based on a vapour pressure of 0.129 mm Hg at 25 Degrees Celsius. It is degraded rapidly in the vapour phase by reactions with photochemically produced hydroxy radicals (half-life of approx. 32 hours in an ambient atmosphere). The aqueous miscibility of Propylene Glycol suggests that physical removal from the atmosphere via rainfall occurs. (4)

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals:	Not available.
Waste Disposal Methods:	This information applies to the material as manufactured. Reevaluation of the product may be required by the user at the time of disposal since the product uses, transformations, mixtures and processes may influence waste classification. Dispose of waste material at an approved (hazardous) waste treatment/disposal facility in accordance with applicable local, provincial and federal regulations. Do not dispose of waste with normal garbage, or to sewer systems.
Safe Handling of Residues:	See "Waste Disposal Methods".
Disposal of Packaging:	Empty containers retain product residue. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Do not dispose of package until thoroughly washed out.

14. TRANSPORTATION INFORMATION

CANADIAN TDG ACT SHIPPING DESCRIPTION:

This product is not regulated by TDG.

Label(s): Not applicable. Placard: Not applicable.

ERAP Index: -----. Exemptions: None known.

US DOT CLASSIFICATION (49CFR 172.101, 172.102):

This product is not regulated by DOT.

Label(s): Not applicable. Placard: Not applicable.

CERCLA-RQ: Not available. Exemptions: None known.

15. REGULATORY INFORMATION

CANADA

CEPA - NSNR:	This material is included on the DSL under the CEPA.
CEPA - NPRI:	Not included.
CANADIAN FOOD AND DRUG ACT/REGULATIONS:	The use of this material/product as a food additive is regulated by Health and Welfare Canada in the Food and Drug Act and the Food and Drug Regulations. It is incumbent on the user of this material/product to ensure any intended food application is consistent with Health and Welfare Canada guidelines. Food Grade designation in no way implies that the product is safe for consumption by humans. (3)

Controlled Products Regulations Classification (WHMIS):

Not regulated.

USA

Environmental Protection Act:	This material is included on the TSCA Inventory.
OSHA HCS (29CFR 1910.1200):	Not regulated.
U.S. FOOD AND DRUG ADMINISTRATION:	This material/product is regulated for use by the US FDA. It is incumbent on the user of this material/product to ensure any intended food application is consistent with US FDA guidelines. Food Grade designation in no way implies that the product is safe for consumption by humans. (3)

NFPA: 0 Health, 1 Fire, 0 Reactivity (3)

HMIS: 0 Health, 1 Fire, 0 Reactivity (3)

INTERNATIONAL

All components of this product are found on the following inventories: EINECS (European Inventory of Existing Commercial Chemical Substances), ACOIN (Australia), MITI (Japan) and Korea.

16. OTHER INFORMATION

REFERENCES

1. RTECS-Registry of Toxic Effects of Chemical Substances, Canadian Centre for Occupational Health and Safety RTECS

database.

2. Clayton, G.D. and Clayton, F.E., Eds., Patty's Industrial Hygiene and Toxicology, 3rd ed., Vol. IIA,B,C, John Wiley and Sons, New York, 1981.
3. Supplier's Material Safety Data Sheet(s).
4. CHEMINFO, through "CCINFOdisc", Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada.
5. Guide to Occupational Exposure Values, 2005, American Conference of Governmental Industrial Hygienists, Cincinnati, 2005.
6. Regulatory Affairs Group, Brenntag Canada Inc.
7. The British Columbia Drug and Poison Information Centre, Poison Managements Manual, Canadian Pharmaceutical Association, Ottawa, 1981.
8. Hensyl, William R., Stedman's Medical Dictionary, 25th Ed., Williams & Wilkins, Baltimore, 1990.

To obtain revised copies of this or other Material Safety Data Sheets, contact your nearest Brenntag Canada Regional office.

British Columbia: 20333-102B Avenue, Langley, BC, V1M 3H1
Phone: (604) 513-9009 Facsimile: (604) 513-9010

Alberta: 6628 - 45 th. Street, Leduc, AB, T9E 7C9
Phone: (780) 986-4544 Facsimile: (780) 986-1070

Manitoba: 681 Plinquet Street, Winnipeg, MB, R2J 2X2
Phone: (204) 233-3416 Facsimile: (204) 233-7005

Ontario: 43 Jutland Road, Toronto, ON, M8Z 2G6
Phone: (416) 259-8231 Facsimile: (416) 259-6175

Quebec: 2900 Jean Baptiste Des., Lachine, PQ, H8T 1C8
Phone: (514) 636-9230 Facsimile: (514) 636-0877

Atlantic: A-105 Akerley Boulevard, Dartmouth, NS, B3B 1R7
Phone: (902) 468-9690 Facsimile: (902) 468-3085

Prepared By: Regulatory Affairs Group, Brenntag Canada Inc., (416) 259-8231.