MATERIAL SAFETY DATA SHEET

1. Product and company identification

PRODUCT NAME	Propylene Glycol
PRODUCT NAME	0684
SUPPLIER	NEMCO RESOURCES LTD. 25 Midland Street Winnipeg, Manitoba R3E 3J6 Canada
Date Issued	October, 2013
Emergency (call collect)	204-788-1030
CANUTEC	613-996-6666

Chemical Family: Aqueous mixture of Glycols.

Molecular Formula: Not applicable.

Product Use: Heat transfer fluid. Chemical intermediate. Coolant/antifreeze. Laboratory reagent.

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	---	15 - 99
Dipotassium Hydrogen Phosphate	7758-11-4	---	0.1 - 5

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Low hazard for usual industrial or commercial handling. At elevated temperatures this product can cause thermal burns. See "Other Health Effects" Section. Can decompose at high temperatures forming toxic gases. Contents may develop pressure on prolonged exposure to heat.

POTENTIAL HEALTH EFFECTS

Inhalation: Contact with mist or spray may cause irritation of mucous membranes, coughing and difficulty in breathing. At elevated temperatures this product can cause thermal burns.

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. At elevated temperatures this product can cause thermal burns. Prolonged and repeated contact may lead to dermatitis.

Skin Absorption: Not likely to be absorbed through the skin.

Eye Contact: Splashes to the eye may cause irritation, redness and pain. At elevated temperatures this product can cause thermal burns.

Ingestion:	This product may cause mild gastrointestinal discomfort. Ingestion of large amounts may cause nausea, gastrointestinal upset and abdominal pain.
Other Health Effects:	Effects (irritancy) on the skin and eyes may be delayed, and damage may occur without the sensation or onset of pain. Strict adherence to first aid measures following any exposure is essential. May cause central nervous system (CNS) depression, liver damage, kidney damage and hypoglycemia. 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. 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. Hypoglycemia is defined as an abnormally low concentration of glucose in the circulating blood. Propylene Glycol: Ingestion of Propylene Glycol by persons with renal impairment may cause lactic acidosis, hyperosmolality, central nervous system depression (CNS) and haemolysis. Dipotassium Hydrogen Phosphate: All phosphate salts, except calcium salts, have a hypothetical risk of hypocalcemia. Potassium salts have a potential risk of hyperkalemia which can cause cardiac arrhythmia. Since phosphates are slowly and incompletely absorbed in the gut, systemic reactions are unlikely when these salts are swallowed. Polyphosphates are thought to be hydrolyzed to orthophosphates before absorption, which may induce a metabolic acidosis. If appreciable amounts of the intact polymer are absorbed from the alimentary tract, hypocalcemic tetany (muscular contraction, pains, tingling, etc., caused by a deficiency of calcium salts) may be a danger due to the binding of ionized calcium. (3)

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, repeat flushing and obtain medical attention.
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. Treatment for thermal, surface burns: 1. Immerse the burned part immediately in ice water to relieve pain and to prevent swelling and blistering. Place cold packs, ice or wet cloths on the burned area if immersion is not possible. 2. Remove anything that is constrictive, such as rings, bracelets or footwear, before swelling begins. 3. Cover the burn with a clean, preferably sterile, lint-free dressing. 4. For severe burns, immediately seek medical attention and monitor breathing and treat for shock. Not intended for medical devices. Potassium salts have a potential risk of hyperkalemia which can cause cardiac arrhythmia. In addition to calcium levels, potassium and phosphate levels should be monitored. Also consider continuous EKG monitoring to detect hyperkalemia. 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 (Estimated)	371- 421 (Estimated)	2.4 (Estimated)	17.4 (Estimated)

Flammability Class (WHMIS):	Not regulated.
Hazardous Combustion Products:	Thermal decomposition products are toxic and may include oxides of potassium pyrophosphate, phosphorus, potassium, carbon and irritating gases. Heating in air may produce irritating aldehydes, acids and ketones. Alcohols.
Unusual Fire or Explosion Hazards:	Violent steam generation or eruption may occur upon application of direct water stream. Spills of these organic liquids on hot fibrous insulation may lead to lowering of the autoignition temperature possibly resulting in spontaneous combustion. (3) 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 explode. Spilled material may cause floors and contact surfaces to become slippery. Propylene Glycol: 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:	Alcohol resistant foam. Use carbon dioxide or dry chemical media for small fires. If only water is available, use it in the form of a fog. Use media appropriate for surrounding fire and/or materials. Do not use high volume water jet.
FIRE FIGHTING INSTRUCTIONS	
Instructions to the Fire Fighters:	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:	In all cases of leak or spill contact vendor at Emergency Number shown on the front page of this MSDS. 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.

7. HANDLING AND STORAGE

HANDLING

Handling Practices:	At normal temperatures: 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. At elevated temperatures: Causes thermal burns.
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.
STORAGE	
Storage Temperature (°C):	See below.
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. Protect against physical damage.
Special Materials to be Used for Packaging or Containers:	Materials of construction for storing the product include: plastics. Equipment for storage, handling or transport should NOT be made from the following material, or, where applicable, its alloys: aluminum, copper, galvanized steel or 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 or 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. 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 available.
Boiling Range (°C):	> 100
Melting/Freezing Point (°C):	-21 to -60
Vapour Pressure (mm Hg at 20° C):	0.07 - 0.22
Vapour Density (Air = 1.0):	2.6
Relative Density (g/cc):	1.02 - 1.07.
Bulk Density:	1 020 - 1 060 kg/m³.
Viscosity:	Not available.

Evaporation Rate (Butyl Acetate = 1.0):	Not available.
Solubility:	Soluble in water.
% Volatile by Volume:	50 - 90
pH:	Not available.
Coefficient of Water/Oil Distribution:	Not available.
Volatile Organic Compounds (VOC):	50 - 90
Flashpoint (°C):	99 - 109 (Estimated)

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY

Under Normal Conditions:	Stable.
Under Fire Conditions:	Not flammable. Not normally a fire hazard. Water content of product prevents ignition.
Hazardous Polymerization:	Will not occur.
Conditions to Avoid:	High temperatures, sparks, open flames and all other sources of ignition. Protect from direct sunlight.
Materials to Avoid:	Strong oxidizing and reducing agents. Lewis or mineral acids. Strong bases. Materials reactive with hydroxyl bearing compounds. Isocyanates. Aluminum and its alloys Steel. Copper and its alloys. galvanized steel.
Decomposition or Combustion Products:	Thermal decomposition products are toxic and may include oxides of potassium pyrophosphate, phosphorus, potassium, carbon and irritating gases. Heating in air may produce irritating aldehydes, acids and ketones. Alcohols.

11. TOXICOLOGICAL INFORMATION

TOXICOLOGICAL DATA:

SUBSTANCE	*LD50 (Oral, Rat)*	*LD50 (Dermal, Rabbit)*	*LC50 (Inhalation, Rat, 4h)*
Propylene Glycol	20 000 mg/kg (1)	20 800 mg/kg (1)	---
Dipotassium Hydrogen Phosphate	> 4 810 mg/kg (3)	> 5 000 mg/kg (3)	---

Carcinogenicity Data:	The ingredient(s) of this product is (are) not classed as carcinogenic by ACGIH, IARC, OSHA or NTP.
Reproductive Data:	No adverse reproductive effects are anticipated.
Mutagenicity Data:	No adverse mutagenic effects are anticipated.
Teratogenicity Data:	No adverse teratogenic effects are anticipated.
Respiratory / Skin Sensitization Data:	None known.
Synergistic Materials:	Dipotassium Hydrogen Phosphate: If this product is used in combination with Trimethylolpropane, Trimethylolpropane derived products or their corresponding Trimethylol alkane homologs, there is a possibility that bicyclic phosphates and/or phosphites may be produced as a result of thermal decomposition. Bicyclic phosphates have acute neurotoxic properties and may cause convulsive seizures in laboratory test animals. Therefore, this product should not be used in conjunction with Trimethylolpropane or its derived products unless tested to determine their decomposition toxicity. (3)

Other Studies Relevant to Material:	Dipotassium Hydrogen Phosphate: Kidney damage was observed in dogs following administration of 800 mg/Kg dipotassium phosphate in the diet for 14 or 38 weeks. No adverse effects were observed after rats were fed 5.1 % in the diet for 150 days. (4) 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:	Not available. Low acute toxicity to aquatic organisms.
Environmental Fate:	Not available. Do not contaminate domestic or irrigation water supplies, lakes, streams, ponds, or rivers. Propylene Glycol: has high mobility in soil. Propylene Glycol: This material is not expected to bioaccumulate. (3)

13. DISPOSAL CONSIDERATIONS

Deactivating Chemicals:	None required.
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. No special treatment required. Empty drums should be completely drained, properly bunged and promptly returned to a drum reconditioner. Treat package in the same manner as the product.

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 TDG.

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

CERCLA-RQ: None known. Exemptions: None known.

15. REGULATORY INFORMATION

CANADA

CEPA - NSNR:	All constituents of this product are included on the DSL.
CEPA - NPRI:	Not included.

Controlled Products Regulations Classification (WHMIS):

Not regulated.

USA

Environmental Protection Act: All constituents of this product are included on the TSCA inventory.

OSHA HCS (29CFR 1910.1200): Not regulated.

NFPA: 0 Health, 1 Fire, 0 Reactivity (6)

HMIS: 0 Health, 1 Fire, 0 Reactivity (6)

INTERNATIONAL

Not available.

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, 2007, American Conference of Governmental Industrial Hygienists, Cincinnati, 2007.
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. NFPA 325M Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids, 1994 Edition, Quincy, MA, 1994.
9. Alkylphenol Ethoxylates (APE) Research Council, Washington, D.C., February, 2000. http://www.aperc.org/canada.htm

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FOR FURTHER INFORMATION, CONTACT:

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