



Philippine Prosperity Chemicals, Inc.

MATERIAL SAFETY DATA SHEET

Date Reviewed :
January 20, 2010

DIETHYLENE GLYCOL

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: DIETHYLENE GLYCOL
Product Code: DEG
Product Type Chemical Solvent
Company: Philippine Prosperity Chemicals, Inc.
Office Address: U1201 Picadilly Star Building
4th Ave. cor 27th St. Fort Bonifacio Global City, Taguig
Plant Addresses: (1) LMG Bulk Terminal – Pinamucan, Batangas
(2) Nagtahan Terminal Inc. – Pandacan, Manila
(3) PPCI In-land Bulk Terminal – Guiguinto, Bulacan
Contact Numbers: Tel: (632) 621-3104 to 09
Fax: (632) 659-6874
Emergency Numbers: Mobile: 0917.5845496 / 0917.5845509

2. COMPOSITION/INFORMATION ON INGREDIENTS

Substance Formal Name: (2-hydroxyethoxy)ethan-2-ol
Substance Chemical Formula: $(\text{HOCH}_2\text{CH}_2)_2\text{O}$
Common name: Diethylene glycol
Synonyms: Ethylene diglycol, 3-oxa-1,5-pentenediol, dihydroxy diethyl ether, 2,2-oxybisethanol
Chemical Abstract Service Registry Number (CAS RNs): 111-46-6

3. HAZARDS IDENTIFICATION

Emergency overview: Warning! Harmful if swallowed, may cause irritation when contact to skin and eyes.
Human Health Hazards:
Inhalation: May cause respiratory tract irritation. May be harmful if inhaled. Inhalation of heated or misted form may cause pulmonary edema.
Ingestion: Low acute toxicity. Probable lethal dose to humans is 0.5-5 g/kg. Causes nerve depression, liver and kidney lesions and anuria (urination retardation). Causes irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.



<i>Skin Contact:</i>	May cause mild skin irritation. May be absorbed through the skin. Passage of diethylene glycol into the body through the skin is possible, but it is unlikely that this would result in harmful effects during safe handling and use.
<i>Eye Contact:</i>	May be an irritant to eyes and surrounding tissues.
<i>Chronic Exposure:</i>	Liver and kidney lesions and damage.
<i>Aggravation of Pre-existing Conditions:</i>	Persons with pre-existing skin disorders or eye problems, or impaired liver, kidney or respiratory function may be more susceptible to the effects of the substance.

4. FIRST AID MEASURES

<i>Inhalation</i>	Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain medical attention immediately. WARNING: It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive.
<i>Ingestion</i>	Obtain medical attention immediately. Do not induce vomiting unless directed to do so by a medical personnel. Never give anything by mouth to an unconscious person.
<i>Skin Contact</i>	Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. If persistent irritation occurs, obtain medical attention. Wash clothing before reuse.
<i>Eye Contact</i>	Immediately flush eyes with gentle but large stream of water for at least 15 minutes, lifting lower and upper eyelids occasionally. If persistent irritation occurs, obtain medical attention.

5. Fire Fighting Measure

<i>Fire:</i>	Combustible liquid! Flash point: 152 °C (305.6 °F) Auto ignition temperature: 227 °C (440.6 °F) Flammable limits in air based on pure DEG % by volume: Lower Flammable Limit: 2.1; Upper Flammable Limit: 12.3
<i>Explosion:</i>	Above flash point condition, vapor-air mixtures are explosive within flammable limits noted above. Sealed containers may rupture when heated. Sensitive to static discharge.
<i>Extinguishing media:</i>	Dry chemical, alcohol-resistant foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool or protect personnel attempting to stop leak and disperse vapors.
<i>Specific Hazards:</i>	Containers exposed to intense heat from fires should be cooled with large quantities of water. The vapor is heavier than air and spreads along the ground and distant ignition is possible.



Special Information:

All storage areas should be provided with adequate firefighting facilities and equipment. The liquid produces a vapor that forms explosive mixtures with air especially in conditions at above flash point temperatures. In the event of a fire, contact the nearest fire station. For the company's own firefighters, they should wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

Special Firefighting Procedure:

Stay upwind. Use self-contained breathing apparatus and protective clothing. Vapor may explode if ignited in an enclosed area. Cool exposed containers with water.

6. ACCIDENTAL CONTROL MEASURES

Personal precautions:

Avoid contact with skin and eyes. Ventilate area of leak or spill thoroughly. Do not breathe vapor. Stay upwind and keep out of low areas. Remove all heat or ignition sources. Evacuate the area of all non-essential personnel. Shut off leaks, if possible and without personal risk.

Personal protection:

Wear appropriate personal protective equipment (PPE) as specified in Section 8.

Environmental precautions:

Contain and recover liquid when possible with an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth) and place in a chemical waste container. Do not use combustible materials such as saw dust. Use non-sparking tools and equipment. Prevent from spreading or entering into drains, ditches, rivers or any waterways by using sand, earth, or other appropriate barriers. Prevent contamination of soil and water.

Clean-up methods - small spillage:

Remove all ignition sources and ventilate area. Evacuate all non-essential personnel. Stop leak if without risk. Dilute with water and mop up, or absorb with an inert dry material and place in a sealable container. Label and seal waste containers for product recovery or appropriate disposal (see Section 13).

Clean-up methods – large spillage:

For large liquid spills (say more than a drum), remove all ignition sources. Evacuate all non-essential personnel. Stop leak if possible and without risk. Do not flush away residues with water. Blanket spill with alcohol resistant foam to limit evaporation or dike area to contain spill and absorb with earth, sand or other non-combustible material. Transfer to a labeled, sealable container for product recovery or proper disposal. Wear appropriate protective clothing to minimize contact with skin. Allow residues to evaporate or soak up with a suitable absorbent material and dispose safely and appropriately (see Section 13).

7. HANDLING AND STORAGE

Handling:

Protect self against physical damage. Avoid contact with skin, eyes and clothing. Do not breathe vapor. Use only in well ventilated areas.



<i>Storage:</i>	Must be stored in a well-ventilated area and keep away from ignition and heat sources. Keep away from aerosols, oxidizing agents and corrosives. The vapor is heavier than air. Beware of accumulation in pits and confined spaces. Breathing losses during storage should be controlled by a suitable vapor treatment system. Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use.
<i>Product transfer:</i>	Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Keep containers closed when not in use. Do not use compressed air for filling, discharging or handling. Containers should be bonded and grounded for transfers to avoid static sparks.
<i>Recommended materials:</i>	For containers or container linings, use mild steel or stainless steel. For gasket and seals use compress asbestos, butyl rubber or Teflon.
<i>Unsuitable materials:</i>	Do not store in certain plastic. Testing of plastic compatibility and suitability prior to storage is recommended. May react with aluminum if temperature is more than 50 °C.
<i>Other Information:</i>	DEG is available from PPCI in bulk or drums. Details are available upon request.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

<i>Engineering Control Measure / Ventilation System:</i>	A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, <i>Industrial Ventilation, A Manual of Recommended Practices</i> , most recent edition, for details.
<i>Occupational Exposure Limit and Standard:</i>	No value assigned for this specific material by American Conference of Governmental Industrial Hygienist (ACGIH). However, the supplier has below recommendations.
<i>Limit type:</i>	Time Weighted Average (TWA) – safe exposure over an eight-hour working day, for a five-day working week over an entire working life.
<i>Unit and Value:</i>	10 mg/m ³ or 2.26 ppm
<i>Respiratory protection:</i>	Not required under normal conditions of handling. If mists are formed, or in confined spaces or where local exhaust ventilation is not practicable, wear a full face-piece or a double cartridge respirator with organic vapor canister NPF 400. It may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-face-piece positive-pressure, air-supplied respirator.



<i>Respiratory protection:</i>	WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
<i>Hand protection:</i>	PVC gloves, chemical resistant gloves or nitrile gloves.
<i>Eye protection:</i>	Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.
<i>Body Protection:</i>	Wear impervious protective clothing such as one-piece overall, including safety shoes or boots, gloves, laboratory coat, apron and any appropriate cotton-made clothing to prevent skin contact.
<i>Specific Hygiene Measures:</i>	Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Always maintain and practice good housekeeping.

9. PHYSICAL AND CHEMICAL PROPERTIES

<i>Appearance:</i>	Clear, colorless liquid
<i>Odor:</i>	Sweet odor
<i>Initial boiling point:</i>	242 °C (467.6 °F)
<i>Freezing point:</i>	-10 °C (14 °F)
<i>Vapor Pressure:</i>	1.3 kPa @ 20 °C
<i>Specific Gravity:</i>	1.117 @ 20 °C
<i>Solubility:</i>	Completely soluble in water
<i>Dynamic viscosity:</i>	35.6 centipoise (cP) @ 21 °C
<i>Vapor density (air=1):</i>	3.66
<i>Flash point:</i>	152 °C
<i>Auto-ignition temperature:</i>	227 °C
<i>Upper flammable limit in air:</i>	12.3 % (v/v)
<i>Lower flammable limit in air:</i>	2.1 % (v/v)
<i>Molecular weight</i>	106.12 g/mole
<i>Evaporation rate, (NBAC = 1):</i>	0.001

10. STABILITY AND REACTIVITY



<i>Stability:</i>	Stable under normal temperature and pressure for use and storage.
<i>Conditions to avoid:</i>	Heat, flames, ignition sources and confined spaces. Slowly decomposed by moisture.
<i>Materials to avoid:</i>	Reacts with strong oxidizing agents, strong acids, amines, nitric acid, and alkalis. Will attack some forms of plastic, rubber, and coatings.
<i>Hazardous decomposition products:</i>	Toxic gases and vapors may be released if involved in a fire. Carbon dioxide and carbon monoxide may form when heated to decomposition.

11. TOXICOLOGICAL INFORMATIONS

<i>Basis for assessment:</i>	Information given is based on product data.
<i>Oral rat, LD₅₀</i>	12,565 mg/kg
<i>Inhalation rat, LC₅₀</i>	9,970 ppm / 4 Hour
<i>Skin rabbit, LD₅₀</i>	12,510 mg/kg
<i>Eye irritation:</i>	Slight irritant.
<i>Skin irritation:</i>	Moderate irritant.
<i>Repeated dose toxicity:</i>	The major hazard from diethylene glycol occurs following the ingestion of relatively large doses. In humans, effects have been reported on the following organs; kidney and gastrointestinal tract. Symptoms may include; headache, nausea and/or vomiting. Abdominal discomfort. The use of topical applications containing this material may not be appropriate in severely burned patients or individuals with impaired renal function. Reports of kidney failure and death in burn patients suggest that diethylene glycol may have been a factor.

12. ECOLOGICAL INFORMATION

<i>Basis for assessment:</i>	Information given is based on product data.
<i>Environmental Fate:</i>	Volatilization from natural bodies of water or moist soil is not expected to be an important fate process. It will not be expected to adsorb to suspended solids and sediments in water. Material is practically non-toxic to aquatic organisms on an acute basis (LC ₅₀ >100 mg/L in the most sensitive species tested). Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise and are toxic.
<i>Bioaccumulation:</i>	The bioconcentration factor (BCF) for diethylene glycol can be estimated to be less than 3.0. This material is not expected to significantly bioaccumulate.

13. Disposal Considerations



<i>Precautions:</i>	Refer to Sections 7 before handling the product or containers.
<i>Waste disposal:</i>	Whatever DEG cannot be saved for recovery or treating, it should be managed in an appropriate and approved waste disposal facility. Care should in any case be taken to ensure disposal is compliant with statutory and regulatory requirements or local environmental laws.
<i>Product disposal:</i>	This product is not suitable for disposal by either landfill or via local sewers, drains, natural streams or rivers. The following advice only applies to the product as supplied. Processing, use or contamination of this product may change the waste management options.
<i>Container disposal:</i>	Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not pressure cut, weld, braze, solder, drill, grind or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. Send to drum handlers that clean, recondition or metal reclaimer. Disposal of container and unused contents must be in accordance to local regulatory requirements and environmental laws.

14. TRANSPORT INFORMATION

<i>UN Number:</i>	Not regulated.
<i>Hazard Class:</i>	Not classified as hazardous material.
<i>Packing Group:</i>	Not applicable.
<i>Proper shipping name:</i>	Diethylene Glycol

15. OTHER INFORMATION

Philippine Prosperity Chemicals, Inc. provides the information contained herein in good faith and was obtained from sources which we believe are reliable. However, the information is provided without any warranty. The condition or methods of handling, storage, use and disposal are beyond our control and may be beyond our knowledge. For this and any other reasons we don't assume responsibility and disclaim liability for loss, damage or expense arising out of or in any way connected with the handling, storage, use and disposal of the product. This document is intended only as a guideline to the appropriate precautionary handling of the material by properly trained personnel using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.