



Philippine Prosperity Chemicals, Inc.

MATERIAL SAFETY DATA SHEET

Date Reviewed :
October 12, 2009

NORMAL BUTYL ALCOHOL

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: NORMAL BUTYL ALCOHOL
Product Code: NBA
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: Butan-1-ol
Substance Chemical Formula: $\text{CH}_3(\text{CH}_2)_2\text{CH}_2\text{OH}$
Common name: N-Butyl Alcohol
Synonyms: 1-Butanol; butanol-1; normal butanol; n-propyl carbinol;
butyric alcohol; 1-hydroxybutane; butyl alcohol.
*Chemical Abstract Service Registry
Number (CAS RNs):* 71-36-3

3. HAZARDS IDENTIFICATION

Emergency overview: Flammable liquid and vapor! During use, it may form a flammable/explosive vapor-air mixture. May be harmful if swallowed. May be harmful if absorbed through skin. Irritating to eyes. May cause skin irritation. May cause respiratory tract irritation. Repeated exposure may cause skin dryness or cracking. Do not swallow. Avoid breathing vapors, mist or gas. Avoid contact with skin, eyes and clothing.

Human Health Hazards:

Inhalation: May cause respiratory tract irritation. Harmful if inhaled. Symptoms of exposure may include: Nasal discharge, hoarseness, coughing, chest pain and breathing difficulty. Nausea, headache, dizziness and drowsiness can result too.



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<i>Ingestion:</i>	May be harmful if swallowed. Symptoms of exposure may include: Nausea, vomiting, loss of appetite, gastrointestinal irritation and/or diarrhea. Central nervous system depression with nausea, headache and mental sluggishness.
<i>Skin Contact:</i>	May cause skin irritation. Symptoms of exposure may include: Crusting, scaling, weeping and itching of skin.
<i>Eye Contact:</i>	Exposure to vapors and liquid Causes eye irritation. Symptoms of exposure may include: Eye irritation, burning sensation, pain, watering and/or change of vision.
<i>Chronic Exposure:</i>	Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering. Repeated exposure may also cause damage to the following organs: heart, kidney and liver damage.
<i>Aggravation of Pre-existing Conditions:</i>	Significant exposure to this chemical may adversely affect people with acute or chronic disease of the: respiratory tract, skin, eyes and central nervous system.

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>	Flammable liquid! Flash point: 37 °C (98.6 °F) Auto ignition temperature: 343 °C (649.5 °F) Flammable limits in air based on pure NBA % by volume: Lower Flammable Limit: 1.4; Upper Flammable Limit: 11.2
<i>Explosion:</i>	Above normal condition, vapor-air mixtures are explosive within flammable limits noted above. Sealed containers may rupture when heated. Sensitive to static discharge.



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<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.
<i>Special Information:</i>	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.
<i>Special Firefighting Procedure:</i>	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

<i>Personal precautions:</i>	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 without personal risk.
<i>Personal protection:</i>	Wear appropriate personal protective equipment (PPE) as specified in Section 8.
<i>Environmental precautions:</i>	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.
<i>Clean-up methods - small spillage:</i>	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).
<i>Clean-up methods – large spillage:</i>	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



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Clean-up methods – large spillage: with a suitable absorbent material and dispose safely and appropriately (see Section 13).

7. HANDLING AND STORAGE

Handling: Avoid inhaling vapor and/or mists. Avoid contact with skin, eyes and clothing. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding all equipment. Avoid splash filling. Do not use compressed air for filling, discharging or handling operations.

Storage: 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.

Product transfer: Electrostatic charges may be generated during pumping and these discharges 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.

Recommended materials: For containers or container linings, use mild steel or stainless steel. For gasket and seals use compress asbestos, butyl rubber or Teflon.

Unsuitable materials: Do not store in certain plastic. May react with aluminum if temperature is more than 50°C.

Other Information: NBA is available from PPCI in bulk or drums. Details are available upon request.

8. EXPOSURE CONTROL / PERSONAL PROTECTION

Engineering Control Measure / Ventilation System: 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, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

Occupational Exposure Limit and Standard: American Conference of Governmental Industrial Hygienist (ACGIH)

Limit type: Threshold Limit Value (TLV) - the level of exposure that the typical worker can experience without an unreasonable risk of disease or injury.



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<i>Unit:</i>	Parts per million (ppm)
<i>Value:</i>	20
<i>Respiratory protection:</i>	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. 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 volatile liquid
<i>Odor:</i>	Mild Alcohol Odor
<i>Initial boiling point:</i>	117 °C (242.6 °F)
<i>Freezing point:</i>	-89 °C (-128.2 °F)
<i>Vapor Pressure:</i>	0.55 kPa @ 20 °C
<i>Specific Gravity:</i>	0.810 @ 20 °C
<i>Solubility:</i>	Soluble in water (7.7 g/100mL)
<i>Dynamic viscosity:</i>	3.0 centipoise (cP) @ 20 °C
<i>Vapor density (air=1):</i>	2.57
<i>Flash point:</i>	37 °C
<i>Auto-ignition temperature:</i>	343 °C
<i>Upper flammable limit in air:</i>	11.2 % (v/v)
<i>Lower flammable limit in air:</i>	1.4 % (v/v)



<i>Molecular weight</i>	72.12 g/mole
<i>Evaporation rate, (NBAC = 1):</i>	0.45

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>	Keep away from sulfuric and other strong inorganic acids, aluminum or lead (including equipment made of these metals), and oxidizing agents such as peroxides, nitric acid, perchloric acid or chromium trioxide.
<i>Hazardous decomposition products:</i>	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>	790 mg/kg
<i>Inhalation rat, LC₅₀</i>	8,000 ppm / 4 Hour
<i>Skin rabbit, LD₅₀</i>	3,400 mg/kg
<i>Eye irritation:</i>	Severe irritant.
<i>Skin irritation:</i>	Moderate irritant.
<i>Special Remarks on Chronic Human Effects:</i>	May cause cancer (tumorigenic) base on animal data. May cause adverse reproductive effects (fertility and fetotoxicity) and birth defects based on animal data.

12. ECOLOGICAL INFORMATION

<i>Basis for assessment:</i>	Information given is based on product data.
<i>Environmental Fate:</i>	Expected to have high mobility in soil. Volatilization of NBA from moist soil surfaces is expected to be important. It is not expected to adsorb to suspended solids and sediment in water. Expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase ethyl acetate is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals and the half-life for this reaction in air is estimated to be 10 days.



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Bioaccumulation: The bioconcentration factor (BCF) for NBA can be estimated to be 0.88. This material is not expected to significantly bioaccumulate.

13. Disposal Considerations

Precautions: Refer to Sections 7 before handling the product or containers.

Waste disposal: Whatever NBA 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.

Product disposal: 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.

Container disposal: 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

UN Number: 1120

Hazard Class: 3 (Flammable Liquid)

Packing Group: III (Flash Point = 37 °C)

Proper shipping name: Butanol

15. OTHER INFORMATION

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