Safety Data Sheet

1. IDENTIFICATION

Product Name:	**N-Butanol**
Other Names:	Butyl Alcohol
Recommended Use:	Solvent for resin, lacquers, wax, printing ink, adhesives, plastics and polishes agent. Raw material for used in the chemical industry such as paints, rubbers, plastic, cosmetics, pharmaceuticals, and dehydrate agents.
Supplier:	Global Chemie ASCC Limited
Street Address:	88/123 Moo 2 Bangpoo Industrial Estate (North), Phraek Sa Mai, Mueang Samutprakan, Samutprakan 10280
Telephone:	+66 2324 6888
Fax:	+66 2324 6898-99
Emergency phone:	+66 2324 6888 ext.320

2. HAZARDS IDENTIFICATION

Hazardous Nature

This product is classified as hazardous under GHS criteria

Hazardous Classification

Flammable liquids : Category 3

Acute Toxicity : Category 4

Skin Irritation : Category 2

Serious eye damage : Category 1

Specific target organ toxicity following single exposure : Category 3

Hazardous Statement

Highly Flammable liquid and vapour

GHS Pictograms

Hazard Statements

H226: Flammable liquid and vapour.

H302: Harmful if swallowed.

H315: Cause skin irritation.

H318: Cause serious eye damage.

H335: May cause respiratory irritation.

H336: May cause drowsiness or dizziness.

Precautionary Statements

P210: Keep away from heat/sparks/open flames/hot surface and Non-smoking

P233: Keep container tightly closed.

P240: Ground/Bond container and receiving equipment.

P241: Use explosion-proof electrical/ventilating/lighting/equipment.

P242: Use only non-sparking tools.
P243: Take precautionary measure against static discharge.
P261: Avoid breathe dust/fume/gas/mist/vapours/spray.
P264: Wash thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P280: Wear protective glove/eye protection/face protection.

Response Statements

If on skin

P303+P361+P353: Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P370+P378: In case of fire: Use manufacturer/supplier or the competent authority to specify appropriate media for extinction.
P302+P352: Wash with plenty of soap and water.
P362: Take off contaminated clothing and wash before reuse.

If inhaled

P304+P340: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

If in eye

P305+P351+P338: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P332+P313: If skin irritation persists: Get medical advice/attention.

If swallowed

P301+P312: Call a poison centre or doctor/physician if you feel unwell.

Storage Statements

P403+P233: Store in a well-ventilated place. Keep container tightly closed.
P235: Keep cool.
P405: Store locked up.

Disposal Statements

P501: Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

Signal Word Danger

3. COMPOSITION: Information on Ingredients

Chemical Ingredient	CAS No.	UN No.	Proportion (%v/v)
n-Butanol	71-36-3	1120	>99.0%

Molecular Formula: $C_4H_{10}O$
Molecular Weight**:** 74.12 g/mol

4. FIRST AID MEASURES

For advice, contact Ramathibodi Poison Centre (Phone: 1367) or a doctor.

Ingestion

Do not induce vomiting; Do not eat milk and castor oil, transport to nearest medical facility for additional treatment.

Eye Contact

Immediately flush eyes with large amounts of water for at least 15 minutes while holding eyelids open. Transport to the nearest medical facility for additional treatment.

Skin Contact

Remove contaminated clothing. Immediately flush skin with large amounts of water for at least 15 minutes and follow by washing with soap and water if available.

Inhalation

Remove to fresh air. If the victim has difficulty breathing or tightness of the chest, give 100% oxygen with rescue breathing or CPR as required and transport to the nearest medical facility.

First Aid facilities

Provide eye baths and safety showers.

Medical Attention

Treat according to symptoms. Avoid gastric lavage: risk of aspiration of product to the lungs with the potential to cause chemical pneumonitis.

5. FIRE FIGHTING MEASURES

Shut off product that may 'fuel' a fire if safe to do so. Allow trained personnel to attend a fire in progress, providing firefighters with this Safety Data Sheet. Prevent extinguishing media from escaping to drains and waterways.

Suitable extinguishing media

Water spray or fog, Dry chemical powder, Alcohol-resistant foam and Carbon dioxide.

Hazards from combustion products

May produce toxic fumes of carbon monoxide, carbon dioxide if burning.

Precautions for fire fighters and special protective equipment

Wear full protective clothing and self-contained breathing apparatus.

Special protective action for fire-fighters

Keep adjacent containers cool by spraying with water.

6. ACCIDENTAL RELEASE MEASURES

Emergency Procedures

Prevent fluid from escaping to drains and waterways. Contain leaking packaging in a containment drum. Prevent vapours from building up in confined areas. Ensure that drain valves are always closed . Clean up and report spills immediately.

Methods and materials for containment

Protective Measures

- Observe all relevant local and international regulations.
- Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see chapter 8 this Material Safety Data Sheet. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers.
- Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

Clean-Up Methods

◆ Small spillage (< 200 LT)	:	Transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
◆ large spillage (> 200 LT)	:	Transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Other Information

Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Vapours may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

7. HANDLING AND STORAGE

Precautions for safe handling

Avoid contact with skin, eyes, and clothing. Do not breathe vapours. Extinguish any naked flame. Remove ignition sources. Avoid sparks. Do not smoke. The vapour is heavier than air spreads along the ground and distant ignition is possible. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Do not use compressed air for filling, discharging, or handling operations. Handle and open container with care in well-ventilated area. Do not empty into drains.

Conditions for safe storage

Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat. Bulk storage tanks should be diked (bunded). Keep away from aerosols, flammables, oxidizing agents, corrosives. Storage Temperature: Ambient.

Incompatible materials

Strong oxidizing agents, alkaline agent, and strong reducing agent.

Recommended Materials

For containers, or container linings use mild steel, stainless steel.

Product Transfer

Keep containers closed when not in use. Do not use compressed air for filling, discharging, or handling operations. If positive displacement pumps are used, these must be fitted with a non-integral pressure relief valve. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

Additional Advice

Containers even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

8. EXPOSURE CONTROLS: PERSONAL PROTECTION

National Exposure Standards

Occupational Exposure Limits

TLV-TWA = 50 ppm

TLV-STEL = 100 ppm

Engineering Controls: Ventilation

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapours below their respective threshold limit value.

Personal Protective Equipment

Respiratory Protection:

Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.

Eye Protection: Chemical splash goggles (chemical monogoggles).

Skin/ Body Protection: Use protective clothing which is chemical resistant to this material. Safety shoes and boots should also be chemical resistant.

Hand Protection: Butyl rubber gloves, Nature rubber gloves, Neoprene rubber gloves, Nitrile rubber gloves.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Unit of Measurement	Typical Value
Appearance	-	Colorless Liqiud
Odour	-	like Ethanol odour
pH	-	No data available
Boiling point	°C	117
Melting point	°C	-89.5

Property	Unit of Measurement	Typical Value
Flash point	°C	36
Flammability	-	Flammable
Autoignition Temperature	°C	343
Decomposition Temperature	°C	No data available
Lower/Upper Flammability Limits	%V	1.4-11.2
Density @ 20°C	g/cm^3	0.809 -0.812
Specific Gravity @ 20°C	-	0.810-0.813
Viscosity @ 20°C	mm^2/s	No data available
Vapor pressure	kPa	0.73
Vapor density	kPa (Air = 1)	2.6
Evaporation Rate	(n-Butyl acetate = 1)	0.5
Water Solubility	g/100ml	7.7
Solubility in other solvents Partition coefficient	(n-octanol/water)	No data available
Coefficient of Thermal Expansion	per Deg °C	No data available
Particle Characteristic	-	No data available

The values listed are indicative of this product's physical and chemical properties. For a full product specification, please consult the Product Data Sheet.

10. STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions.

Conditions to avoid

Heat, flame, spark and other ignition sources.

Hazardous decomposition products

Thermal decomposition is highly dependent on conditions. Carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation. May form explosive peroxides.

Hazardous reactions

None known.

Hazardous Polymerisation

No.

Materials to Avoid

Strong oxidizing agents, alkaline agent, and strong reducing agent.

Chemical Reactivity

Stable under normal conditions.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

- LD_{50} Acute oral toxicity : 790 mg/kg , (rat)
- LD_{50} Acute dermal toxicity : 3,400 mg/kg , (rabbit)
- LC_{50} Acute Inhalation Toxicity : 8,000 mg/l/ 4 hours , (rat)

Eye Contact

Irritating to eyes Inflammation of the eye is characterized by redness, pain and itching.

Skin Contact

Irritating to skin.

Inhalation

Inhalation of vapours or mists may cause irritation to the respiratory system and may cause drowsiness and dizziness.

Carcinogenicity

No data available.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic Toxicity

- Fish : Low toxicity : LC_{50} : 1,730 mg/l/96 h.
- Algae : Low toxicity : EC_{50} : 1,983 mg/l/48 h.

Persistence/ degradability

Readily biodegradable.

Mobility

Dissolves in water. If product enters soil, it will highly mobile and may contaminate groundwater.

Bio-accumulation

Has the potential to bioaccumulate low.

13. DISPOSAL CONSIDERATIONS

Disposal Methods

Material Disposal

Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classifications and disposal methods in compliance with applicable regulations.

Container Disposal

Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Refer to Section 7 before handling the product or containers. Residues may cause an explosion hazard. Do not puncture, cut or weld unclenaed drums. Send to drum recovered or metal reclaimer.

Local Legislation

Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied.

14. TRANSPORT INFORMATION

Road and Rail Transport		Marine Transport		Air Transport	
UN. Number	1120	UN. Number	1120	UN. Number	1120
Class/Item	3	Class/Item	3	Class/Item	3
Hazard Symbol	Flammable Liquid	Hazard Symbol	Flammable Liquid	Hazard Symbol	Flammable Liquid
Proper Shipping Name	n-Butanol	Proper Shipping Name	n-Butanol	Proper Shipping Name	n-Butanol
Packing Group	III	Packing Group	III	Packing Group	III
		Marine Pollutant	No		

15. REGULATORY INFORMATION

EC Label Name:	n-Butanol
EC Classification:	Flammable.
EINECS (EC):	200-751-6
EC Annex I Number:	603-004-00-6
RETCS:	RO 1400000

16. OTHER INFORMATION

National Fire Protection Association (USA)	:	No data available.
SDS Distribution	:	The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty of guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.
Prepared By	:	Quality Control Department. / Global Chemie ASCC Limited

Abbreviations:

AICS: Australian Inventory of Chemical Substances
CAS Number: Chemical Abstracts Number
IARC: International Agency for Research on Cancer
N/A: not available
NOHSC: National Occupational Health and Safety Council GHS: Global Harmonized System

References:

- Supplier Material Safety Data Sheets
- http://chem.sis.nlm.nih.gov/chemidplus (October 18)
- http://hsis.ascc.gov.au/SearchHS.aspx (October 18)
- Ecotoxicology data: http://cfpub.epa.gov/ecotox/quick_query.htm (October 18)
- *Sax's Dangerous Properties of Industrial Materials*, Richard J. Lewis Snr., pub. Canada (2000)
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The information sourced for the preparation of this document was correct and complete at the time of writing to the best of the writer's knowledge. The document represents the commitment to the company's responsibilities surrounding the supply of this product, undertaken in good faith. This document should be taken as a safety guide for the product and its recommended uses but is in no way an absolute authority. Please consult the relevant legislation and regulations governing the use and storage of this type of product. No warranty and guarantee are expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product for further information, please contact Global Chemie ASCC Limited