SAFETY DATA SHEET: n-BUTANOL

IN CASE OF TRANSPORTATION EMERGENCY CONTACT:
CHEMTREC:(800) 424-9300

ALL OTHER INQUIRIES:
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1. IDENTIFICATION

PRODUCT NAME:	n-Butyl Alcohol
SYNONYMS:	Propylcarbinal, 1-Butanol
CAS #:	71-36-3
USES:	Solvent

2. HAZARDS IDENTIFICATION

Emergency Overview

SIGNAL WORD: DANGER!!

Danger	Highly flammable
State of matter	liquid clear, colorless
Odor	alcohol-like

Potential environmental effects

Environmental precautions
Should not be released into the environment. Prevent further leakage or spillage if safe to do so.

Potential health effects

Acute effects

Eyes	Causes eye irritation.
Skin	Prolonged or repeated skin contact with liquid may cause defatting resulting in drying, redness and possible blistering.
Inhalation;	May cause respiratory tract inrritation
Ingestion:	Aspiration hazard if swallowed - can enter lungs and cause damage

3. COMPOSITION

Components	CAS #	Weight percent
n-Butanol	71-36-3	99.85 - 100%
Isobutanol or other Alcohols	78-83-1	0.2 % max
Water (KARL FISCHER METHOD)		0.1 % max

Toxicological Data on Ingredients: 1-Butanol: ORAL (LD50): Acute: 790 mg/kg [Rat.]. DERMAL (LD50): Acute: 3400 mg/kg [Rabbit.].

4. FIRST AID MEASURES

Eye Contact:
Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Cold water may be used. Get medical attention immediately.

Skin Contact:
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Cover the irritated skin with an emollient. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an antibacterial cream. Seek immediate medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

Indication of any immediate medical attention and special treatment needed:

Hazards: Vapors have a narcotic effect and may cause headache, fatigue, dizziness, and nausea.

Treatment: Treat symptomatically.

5. FIRE FIGHTING MEASURES

Flammability of the Product: Flammable.

Auto-Ignition Temperature: 343°C (649.4°F)

Flash Points: CLOSED CUP: 28.9°C (84°F). OPEN CUP: 36.1°C (97°F) (Cleveland).

Flammable Limits: LOWER: 1.4% UPPER: 11.2%

Products of Combustion: These products are carbon oxides (CO, CO2).

Fire Hazards in Presence of Various Substances:
Highly flammable in presence of open flames and sparks. Flammable in presence of heat, of oxidizing materials, of reducing materials, of combustible materials.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, soluble or dispersed in water. SMALL FIRE: Use DRY chemical powder. LARGE FIRE: Use alcohol foam, water spray or fog. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion.

Special Remarks on Fire Hazards: May form explosive mixtures with air. CAUTION: MAY BURN WITH NEAR INVISIBLE FLAME

Special Remarks on Explosion Hazards: Not available.

6. ACCIDENTAL RELEASE MEASURES

Small Spill:

Dilute with water and mop up, or absorb with an inert dry material and place in an appropriate waste disposal container.

Large Spill:

Flammable liquid. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

7. HANDLING AND STORAGE

Precautions:
Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/ vapor/spray. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents, reducing agents.

Storage:
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. Avoid all possible sources of ignition (spark or flame).

8. EXPOSURE CONTROLS AND PERSONAL PROECTION

Engineering Controls:
Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:
Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:
Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure guidelines:
Country specific exposure limits have not been established and are not applicable unless specified below.

COMPONENT	CAS#	EXPOSURE LIMITS	
n-Butanol	71-36-3	US OSHA US TLV	100 ppm PEL 20 ppm TWA
Isobutanol or other Alcohols	78-83-1	US OSHA US TLV	100 ppm PEL 50 ppm TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state and appearance: Liquid.

Odor: Vinous. (Slight.)

Odor Threshold: 083 ppm

Taste: Not available.

Molecular Weight: 74.12g/mole

Color: Colorless.

pH (1% soln/water): Not available.

Boiling Point: 117.7°C (243.9°F)

Melting Point: -89.5°C (-129.1°F)

Freezing point: -89°C (-128.2°F)

Flashpoint tag closed cup: 36°C (96.8°F)

Autoignition Temperature: 343°C (649.4°F); ASTM D 2155

Specific Gravity: 0.81(Water = 1) @ 20˚C (68˚ F)

Vapor Pressure: 0.6 kPa (@ 20°C)

Vapor Density: 2.55 (Air = 1)

Volatility: Not available.

Evaporation rate (n-butyl acetate =1): 0.5

Molecular Weight: 74.12

Dispersion Properties: See solubility in water, methanol, diethyl ether, n-octanol.

Solubility:
Easily soluble in methanol, diethyl ether. Partially soluble in cold water, hot water, n-octanol.

10. STABILITY AND REACTIVITY

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Not available.

Conditions to avoid: Heat, sparks, open flame

Materials to Avoid: Oxidizing materials can cause a vigorous reaction

Incompatibility with various substances:
Highly reactive with oxidizing agents, reducing agents. Slightly reactive to reactive with organic materials, acids, alkalis.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity: Not available.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

Hazardous decomposition: As with any other organic material, combustion will produce carbon dioxide and probably carbon monoxide.

11. TOXICOLOGICAL INFORMATION

Routes of Entry: Dermal contact. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:
WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 790 mg/kg [Rat.]. Acute dermal toxicity (LD50): 3400 mg/kg [Rabbit.]. Acute toxicity of the vapor (LC50): 8000 4 hours [Rat.].

Chronic Effects on Humans: Not available.

Other Toxic Effects on Humans:
Very hazardous in case of skin contact (irritant, permeator), of ingestion, of inhalation. Slightly hazardous in case of skin contact (sensitizer).

Special Remarks on Toxicity to Animals: Not available.

Special Remarks on Chronic Effects on Humans: Can cause gastrointestinal disturbances.

Special Remarks on other Toxic Effects on Humans: Exposure can cause nausea, headache and vomiting.

12. ECOLOGICAL INFORMATION

Toxicity:
Acute toxicity
Fish: LC50 – Fathead Minnow – 1376 mg/l – 96 h
Aquatic invertebrates: : LC50 – Daphnid – 1328 mg/L – 48 h

Chronic toxicity
Fish: No data available
Aquatic invertebrates: No data available

13. DISPOSAL CONSIDERATIONS

WASTE CLASSIFICATION
US. EPA Resource Conservation and Recovery Act: (RCRA) D List of Characteristic Hazardous Wastes (40 CFR 261.21-24): D001

WASTE FROM RESIDUES/UNUSED PRODUCTS
In accordance with local and national regulations.Do not contaminate ponds, waterways or ditches with chemical or used container. The product should not be allowed to enter drains, water courses or the soil.

UNCLEANED EMPTY PACKAGING
Do not burn, or use a cutting torch on, the empty drum., Triple rinse containers., Can be offered for recycling, re-conditioning or puncture.

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted incinerator or other thermal destruction device.
Since emptied containers retain product residue, follow warnings contained in this SDS even after container has been emptied. Residual vapors may explode on ignition; do not cut, grind, or weld on or near containers even after emptying.

14. TRANSPORT INFORMATION

DOT/49 CFR: UN 1120, BUTANOLS, 3, III
REPORTABLE QUANITY: 5000

IMDG UN 1120, BUTANOLS, 3, III; EmS F-E, S-D

ICAO/IATA UN 1120 BUTANOLS, 3, III

15. REGULATORY INFORMATION

U.S. Federal Classifications:

OSHA Hazards
Flammable liquid, Mild eye irritant, Mild skin irritant

SARA 311/312
Fire Hazard, Acute Health Hazard

U.S. Regulated Ingredients:

Hazard information reporting
US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

Components	CAS-No.
Butan-1-ol	71-36-3

US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

Components	CAS-No.
Butan-1-ol	71-36-3

US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

Components	CAS-No.
Butan-1-ol	71-36-3

US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

Components	CAS. No
Butan-1-ol	71-36-3

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

Components CAS-No.

SARA 302: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SPILL REPORTING
US. EPA CERCLA Hazardous Substances (40 CFR 302)

Components	CAS No	Reportable Quantity
Butan-1-ol	71-36-3	5,000lbs 1,000lbs 10 mg/L 10,000 mg/kg 1,000 mgkg 100 mg/L100 lbs 5,000 lbs 1 lbs

Health
US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

Components: Not listed

INVENTORIES

EU list of exisiting chemical substances:
All chemical constituents are listed in: EU list of existing chemical substances

US TSCA Inventory:
All chemical constituents are listed in: US TSCA Inventory

Australian Inv. of Chem. Substances AICS
All chemical constituents are listed in: Australian Inv. of Chem. Substances AICS

Canadian Domestic Substances List DSL
All chemical constituents are listed in: Canadian Domestic Substances List DSL

Jap. Inv. of Exist. & New Chemicals ENCS
All chemical constituents are listed in: Jap. Inv. of Exist. & New Chemicals ENCS

Korean Exist. Chemicals List ECL
All chemical constituents are listed in: Korean Exist. Chemicals List ECL

Philippines Inv. of Chem. Subst. PICCS
All chemical constituents are listed in: Philippines Inv. of Chem. Subst. PICCS

Inv. of Exist. Chem. Substances in China
All chemical constituents are listed in: Inv. of Exist. Chem. Substances in China

Japan ISHL Listing
All chemical constituents are listed in: Japan ISHL Listing

New Zealand Inventory of Chemicals
Components Not listed n-Butanol

Other international regulations
WHMIS Classification
B2: Flammable liquid
D2B: Toxic Material Causing Other Toxic Effects

16. OTHER INFORMATION

Hazard Ratings

HEALTH	FLAMMABILITY	REACTIVITY HAZARD

HMIS	2	3	0
NFPA	1	3	0

All reasonable efforts were exercised to compile this SDS in accordance with ISO 11014 and ANSIZ400.1.1993. The SDS provides information regarding the health, safety and environmental hazards, at the date of issue, to facilitate the safe receipt, use and handling of the product in the workplace. Since CISCO and its subsidiaries cannot anticipate or control all conditions under which the product may be handled, used and received in the workplace, it remains the obligation of each user, receiver or handler to, prior to usage, review this SDS in the context within which the product will be received, handled or used in the workplace. The user, handler or receiver must ensure that the necessary mitigating measures are in place as regards health and safety. This does not substitute the need or requirement for any relevant risk assessments to be conducted. It further remains the responsibility of the receiver, handler or user to communicate such information to all relevant parties that may be involved in the receipt, use or handling of the product. Although all reasonable efforts were exercised in the compilation of this SDS, CISCO does not expressly warrant the accuracy or assume any liability for the incompleteness of the information contained herein or any advice given. The product is sold and risk passes in accordance with the specific terms and conditions of sale.

Date Created: 3/26/2015
Date Updated: 5/21/2015