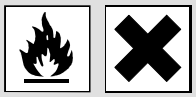
TCI AMERICA

Material Safety Data Sheet

HAZARD WARNINGS	RISK PHRASES	PROTECTIVE CLOTHING
	**Combustible material; avoid heat and sources of ignition.** **Harmful compound, minimize exposure.** **Irritating to skin, eyes, and the respiratory system.** **Hygroscopic -- keep container tightly sealed.** **Store under nitrogen.**	

Section I. Chemical Product and Company Identification

Chemical Name **1-Butanol**

Catalog Number	B0704
Synonym	Butyl Alcohol
Chemical Formula	$CH_3(CH_2)_3OH$
CAS Number	71-36-3

Supplier
TCI America
9211 N. Harborgate St.
Portland OR
1-800-423-8616

In case of Emergency Call
Chemtrec®
(800) 424-9300 (U.S.)
(703) 527-3887 (International)

Section II. Composition and Information on Ingredients

Chemical Name	CAS Number	Percent (%)	TLV/PEL	Toxicology Data
1-Butanol	71-36-3	Min. 99.0%(GC)	Not available.	Rat LD_{50} (oral) 790 mg/kg Rabbit LD_{50} (dermal) 3400 mg/kg Rat LD_{50} (inhalation) 8000 ppm/4H

Section III. Hazards Identification

Acute Health Effects

Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering.
Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Chronic Health Effects

CARCINOGENIC EFFECTS : Not available.
MUTAGENIC EFFECTS : Not available.
TERATOGENIC EFFECTS : Not available.
DEVELOPMENTAL TOXICITY: REPRODUCTIVE EFFECTS
Rat TDLo Oral; 32100 mg/kg; female 8 weeks prior to mating and 0-20 days of prior to matinggnancy
TOXIC EFFECTS
Specific Developmental Abnormalities - Craniofacial (including nose and tongue)
Specific Developmental Abnormalities - Musculoskeletal system.
TDLo Oral; 35295 mg/kg; female 1-15 days of pregnancy
TOXIC EFFECTS
Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus)
Effects on Newborn - Biochemical and matabolic
TDLo Oral; 113 gm/kg; female 1-20 days of pregnancy
TOXIC EFFECTS
Effects on Embryo or Fetus -Fetotoxicity (except death, e.g., stunted fetus)
Specific Developmental Abnormalities - Musculoskeletal system
Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.

Section IV. First Aid Measures

Eye Contact

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact

In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

Inhalation

If the victim is not breathing, perform mouth-to-mouth resuscitation. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, oxygen can be administered. Seek medical attention if respiration problems do not improve.

Ingestion

INDUCE VOMITING by sticking finger in throat. Lower the head so that the vomit will not reenter the mouth and throat. Loosen tight clothing such as a collar, tie, belt or waistband. If the victim is not breathing, perform mouth-to-mouth resuscitation. Examine the lips and mouth to ascertain whether the tissues are damaged, a possible indication that the toxic material was ingested; the absence of such signs, however, is not conclusive.

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Section V. Fire and Explosion Data

Flammability	Combustible.	Auto-Ignition	365°C (689°F)
Flash Points	37°C (98.6°F).	Flammable Limits	LOWER: 1.4% UPPER: 11.2%
Combustion Products	These products are toxic carbon oxides (CO, CO_2).		
Fire Hazards	Not available.		
Explosion Hazards	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	Combustible. 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. Consult with local fire authorities before attempting large scale fire-fighting operations.		

Section VI. Accidental Release Measures

Spill Cleanup Instructions	Combustible Material. Harmful Material. Irritating Material. Hygroscopic Material. Keep away from heat. Mechanical exhaust required. 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. Consult federal, state, and/or local authorities for assistance on disposal.

Section VII. Handling and Storage

Handling and Storage Information	COMBUSTIBLE. HARMFUL. IRRITANT. HYGROSCOPIC. STORE UNDER NITROGEN. Keep away from heat. Mechanical exhaust required. Avoid excessive heat and light. Do not breathe gas/fumes/ vapor/spray. Always store away from incompatible compounds such as oxidizing agents, reducing agents, acids, alkalis (bases), moisture.

Section VIII. Exposure Controls/Personal Protection

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 station and safety shower is proximal to the work-station location.
Personal Protection	Splash goggles. Lab coat. Vapor respirator. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent. 
Exposure Limits	Not available.

Section IX. Physical and Chemical Properties

Physical state @ 20°C	Liquid. (Clear, Colorless.)	Solubility	Soluble in water (7.7g/100mL @ 20°C) Miscible in ether, benzene, acetone, ethanol, many organic solvents, ethyl ether.
Specific Gravity	0.811(water=1)		
Molecular Weight	74.12	Partition Coefficient	LOG P_{ow} 0.88
Boiling Point	118°C (244.4°F)	Vapor Pressure	0.7 kPa (@ 20°C)
Melting Point	-90°C (-130°F)	Vapor Density	2.6 (Air = 1)
Refractive Index	1.398 to 1.400	Volatility	Not available.
Critical Temperature	Not available.	Odor	Characteristic.
Viscosity	0.003 Pas @ 20°C	Taste	Not available.

Section X. Stability and Reactivity Data

Stability	This material is stable if stored under proper conditions. (See Section VII for instructions)
Conditions of Instability	Avoid excessive heat and light.
Incompatibilities	Reactive with strong oxidizing agents, reducing agents, strong acids, alkalis (bases), moisture, halogens, alkali metals, strong mineral acids, acid chlorides, and anhydrides. This compound will attack some forms of plastic, rubber, and coatings.

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Section XI. Toxicological Information

RTECS Number	EO1400000
Routes of Exposure	Eye Contact. Ingestion. Inhalation.
Toxicity Data	Rat LD_{50} (oral) 790 mg/kg Rabbit LD_{50} (dermal) 3400 mg/kg Rat LD_{50} (inhalation) 8000 ppm/4H
Chronic Toxic Effects	**CARCINOGENIC EFFECTS** : Not available. **MUTAGENIC EFFECTS** : Not available. **TERATOGENIC EFFECTS** : Not available. **DEVELOPMENTAL TOXICITY**: REPRODUCTIVE EFFECTS Rat TDLo Oral; 32100 mg/kg; female 8 weeks prior to mating and 0-20 days of prior to matinggnancy TOXIC EFFECTS Specific Developmental Abnormalities - Craniofacial (including nose and tongue) Specific Developmental Abnormalities - Musculoskeletal system. TDLo Oral; 35295 mg/kg; female 1-15 days of pregnancy TOXIC EFFECTS Effects on Embryo or Fetus - Fetotoxicity (except death, e.g., stunted fetus) Effects on Newborn - Biochemical and matabolic TDLo Oral; 113 gm/kg; female 1-20 days of pregnancy TOXIC EFFECTS Effects on Embryo or Fetus -Fetotoxicity (except death, e.g., stunted fetus) Specific Developmental Abnormalities - Musculoskeletal system Repeated or prolonged exposure to this compound is not known to aggravate existing medical conditions.
Acute Toxic Effects	Harmful if ingested or inhaled. Minimize exposure to this material. Severe overexposure can result in injury or death. Irritating to eyes and skin on contact. Inhalation causes irritation of the lungs and respiratory system. Inflammation of the eye is characterized by redness, watering, and itching. Skin inflammation is characterized by itching, scaling, reddening, or, occasionally, blistering. Follow safe industrial hygiene practices and always wear proper protective equipment when handling this compound.

Section XII. Ecological Information

Ecotoxicity	Not available.
Environmental Fate	n-Butyl alcohol's production and use as a solvent for many natural resins, an ingredient in paint removers and industrial cleaners may result in its release to the environment through various waste streams. n-Butyl alcohol is an aroma component of apples and is also found in many foods. If released to air, a vapor pressure of 7 mm Hg at 25 deg C indicates n-butyl alcohol will exist solely as a vapor in the ambient atmosphere. Vapor-phase n-butyl alcohol will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 46 hours. If released to soil, n-butyl alcohol is expected to have high mobility based upon an estimated Koc of 72. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 8.8X10-6 atm-cu m/mole. n-Butyl alcohol may volatilize from dry soil surfaces based upon its vapor pressure. The biodegradation half-life of n-butyl alcohol in a sub-surface soil was approximately 7 days. If released into water, n-butyl alcohol is not expected to adsorb to suspended solids and sediment in water based upon the estimated Koc. Volatilization from water surfaces is expected to be an important environmental fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 2 and 29 days, respectively. In a river die-away test, n-butyl alcohol achieved 33% of its theoretical BOD in 5 days, suggesting biodegradation will be an important fate process in water. An estimated BCF of 3 suggests the potential for bioconcentration in aquatic organisms is low. Hydrolysis is not expected to be an important environmental fate process since this compound lacks functional groups that hydrolyze under environmental conditions. Occupational exposure may occur through inhalation and dermal contact with this compound at workplaces where n-butyl alcohol is produced or used. The general population is exposed to n-butyl alcohol through the ingestion of foods that contain this compound and inhalation of ambient air.

Section XIII. Disposal Considerations

Waste Disposal	Recycle to process, if possible. Consult your local regional authorities. You may be able to dissolve or mix material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber system. Observe all federal, state and local regulations when disposing of the substance.

Section XIV. Transport Information

DOT Classification	DOT Class 3: Flammable liquid.
PIN Number	UN1120
Proper Shipping Name	Butanols
Packing Group (PG)	III
DOT Pictograms	

Continued on Next Page Emergency phone number (800) 424-9300

Section XV. Other Regulatory Information and Pictograms

TSCA Chemical Inventory (EPA)	This compound is **ON** the EPA Toxic Substances Control Act (TSCA) inventory list.
WHMIS Classification (Canada)	CLASS B-2: Flammable liquid with a flash point lower than 37.8℃ (100℉). On DSL.
EINECS Number (EEC)	200-751-6
EEC Risk Statements	R20/21/22- Harmful by inhalation, in contact with skin and if swallowed. R36/37/38- Irritating to eyes, respiratory system and skin.
Japanese Regulatory Data	ENCS No. (2)-3049

Section XVI. Other Information

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Notice to Reader