

MATERIAL SAFETY DATA SHEET

Section 1 - Chemical Product and Company Identification

MSDS Name: 1-Butanol

Catalog Numbers: AC107690000, AC107690010, AC107690025, AC107690200, AC167690000, AC167691000, AC167691000, AC167695000, AC232080000, AC232080010, AC232080025, AC423490000, AC423490000, AC423490010, AC423490040, AC423492000, AC423495000, AC610020040, AC610020040, AC610251000, S75058, S79930, S79930-1, S799302, S79932HPLC, S93100, A383-1, A383-4, A383J4, A383SK-1, A383SK-4, A398-4, A399-1, A399-20, A399-4, A399-4LC, A399-500, A399J4, A399J500, A399S-4, A400-4, BP2603-100, BP505-25, BP505-500, NC9025368, NC9210506, NC9307711, NC9321763, NC9926765, S79930-2MF*, S79932SPEC, XXA399200LI, XXA399TEST

Synonyms: n-Butanol; 1-Butanol; n-Butyl alcohol; 1-Butyl alcohol; Butyl hydroxide; 1-Hydroxybutane; Methylolpropane; n-Propylcarbinol; Propylmethanol; Butyric alcohol.

Company Identification: Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410

For information in the US, call: 201-796-7100

Emergency Number US: 201-796-7100

CHEMTREC Phone Number, US: 800-424-9300

Section 2 - Composition, Information on Ingredients

CAS#: 71-36-3
Chemical Name: n-Butyl alcohol
%: > 99
EINECS#: 200-751-6

Hazard Symbols: XN



Risk Phrases: 10 22 37/38 41 67

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Warning! Flammable liquid and vapor. May be harmful if swallowed. May cause central nervous system depression. Aspiration hazard if swallowed. Can enter lungs and cause damage. Causes severe eye irritation and possible eye injury. Breathing vapors may cause drowsiness and dizziness. Causes skin and respiratory tract irritation. Target Organs: Central nervous system, respiratory system, eyes, skin.

Potential Health Effects

Eye: Causes severe eye irritation. May cause corneal edema and inflammation. May cause lacrimation (tearing), blurred vision, and photophobia.

Skin: Causes skin irritation. Skin absorption is slight. Repeated or prolonged exposure may cause drying and cracking of the skin.

Ingestion: May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal. May be harmful if

swallowed.

Inhalation: Causes respiratory tract irritation. May cause cardiovascular disturbances, hearing abnormalities, central nervous system depression, muscle weakness, and possible death due to respiratory failure. May be absorbed through the lungs.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. May cause damage to the auditory nerve (some hearing loss) and vestibular injury. Animal evidence suggests that fetotoxicity and teratogenicity may be observed at doses that also cause harmful effects in the mothers. The systemic toxicity of n-butanol is low, although it may potentiate the hepatic (liver) toxicity of other inhaled compounds, such as carbon tetrachloride.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid immediately.

Skin: In case of contact, flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid if irritation develops and persists. Wash clothing before reuse.

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs naturally, have victim lean forward.

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

Notes to Alcoholic beverage consumption may enhance the toxic effects of this substance.

Physician: Persons with liver, kidney, or central nervous system diseases may be at increased risk from exposure to this product. Butanol is especially toxic if aspirated. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Use water spray to keep fire-exposed containers cool. Flammable liquid and vapor. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas.

Extinguishing Media: Use water spray, dry chemical, carbon dioxide, or appropriate foam.

Autoignition Temperature: 343 deg C (649.40 deg F)

Flash Point: 35 deg C (95.00 deg F)

Explosion Limits: Lower: 1.4 vol %

Explosion Limits: Upper: 11.2 vol %

NFPA Rating: health: 2; flammability: 3; instability: 0;

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Remove all sources of ignition. Provide ventilation. Use only non-sparking tools and equipment.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Use spark-proof tools and explosion proof equipment. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Do not ingest or inhale. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Keep away from heat, sparks and flame.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Store in a cool, dry, well-ventilated area away from incompatible substances.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls:

Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA -
Final PELs			
n-Butyl alcohol	20 ppm	1400 ppm IDLH	100 ppm
TWA; 300			mg/m3
TWA			

OSHA Vacated PELs: n-Butyl alcohol: None listed

Personal Protective Equipment

- Eyes:** Wear chemical splash goggles.
- Skin:** Wear appropriate protective gloves to prevent skin exposure.
- Clothing:** Wear appropriate protective clothing to prevent skin exposure.
- Respirators:** A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant respirator use.

Section 9 - Physical and Chemical Properties

- Physical State:** Liquid
- Color:** colorless
- Odor:** vinous or wine-like
- pH:** Not available
- Vapor Pressure:** 6.7 mm Hg @ 25 deg C
- Vapor Density:** 2.6 (Air=1)
- Evaporation Rate:** 0.46 (Butyl acetate=1)
- Viscosity:** 2.94 cP at 20 deg C
- Boiling Point:** 116 deg C (240.80°F)
- Freezing/Melting Point:** -89.5 deg C (-129.10°F)
- Decomposition Temperature:** Not available
- Solubility in water:** Slightly soluble
- Specific Gravity/Density:** 0.8100 (Water=1)
- Molecular Formula:** C4H10O
- Molecular Weight:** 74.12

Section 10 - Stability and Reactivity

- Chemical Stability:** Stable under normal temperatures and pressures.
- Conditions to Avoid:** Ignition sources, excess heat, confined spaces.
- Incompatibilities with Other Materials** Strong oxidizing agents, strong acids, alkali metals, halogens.
- Hazardous Decomposition Products** Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide.
- Hazardous Polymerization** Will not occur.

Section 11 - Toxicological Information

RTECS#: CAS# 71-36-3: EO1400000
LD50/LC50: RTECS:
CAS# 71-36-3: Draize test, rabbit, eye: 2 mg Severe;
Draize test, rabbit, eye: 2 mg/24H Severe;
Draize test, rabbit, skin: 405 mg/24H Moderate;
Draize test, rabbit, skin: 20 mg/24H Moderate;
Inhalation, rat: LC50 = 8000 ppm/4H;
Inhalation, rat: LC50 = 24000 mg/m³/4H;
Oral, mouse: LD50 = 100 mg/kg;
Oral, rabbit: LD50 = 3484 mg/kg;
Oral, rabbit: LD50 = 3400 mg/kg;
Oral, rat: LD50 = 790 mg/kg;
Oral, rat: LD50 = 800 mg/kg;
Skin, rabbit: LD50 = 3400 mg/kg;

Carcinogenicity: n-Butyl alcohol - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.
Epidemiology: Not available
Teratogenicity: See actual entry in RTECS for complete information.
Reproductive: See actual entry in RTECS for complete information.
Neurotoxicity: Not available
Mutagenicity: See actual entry in RTECS for complete information.
Other: Not available

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 1510-1730 mg/L; 96 Hr; Static bioassay at 24.7°C (pH 7.64)
Water flea Daphnia: EC50 = 1980-1983 mg/L; 48 Hr; Unspecified
Bacteria: Phytobacterium phosphoreum: EC50 = 2817-3710 mg/L; 5,30 min; Microtox test

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification. RCRA P-Series: None listed. RCRA U-Series: CAS# 71-36-3: waste number U031 (Ignitable waste).

Section 14 - Transport Information

US DOT
Shipping Name: BUTANOLS
Hazard Class: 3
UN Number: UN1120
Packing Group: III
Canada TDG
Shipping Name: Not available
Hazard Class:
UN Number:
Packing Group:
USA RQ: CAS# 71-36-3: 5000 lb final RQ; 2270 kg final RQ

Section 15 - Regulatory Information

US Federal

TSCA

CAS# 71-36-3 is listed on the TSCA Inventory.

Health & Safety Reporting List	None of the chemicals are on the Health & Safety Reporting List.
Chemical Test Rules Section 12b	None of the chemicals in this product are under a Chemical Test Rule.
TSCA Significant New Use Rule	None of the chemicals are listed under TSCA Section 12b. None of the chemicals in this material have a SNUR under TSCA.
CERCLA Hazardous Substances and corresponding RQs	CAS# 71-36-3: 5000 lb final RQ; 2270 kg final RQ
SARA Section 302 Extremely Hazardous Substances	None of the chemicals in this product have a TPQ.
SARA Codes Section 313	CAS # 71-36-3: acute, flammable. This material contains n-Butyl alcohol (CAS# 71-36-3, 99%), which is subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 372.
Clean Air Act:	This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depletors. This material does not contain any Class 2 Ozone depletors.
Clean Water Act:	None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.
OSHA: STATE	n-Butyl alcohol can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.
California Prop 65	
California No Significant Risk Level:	None of the chemicals in this product are listed.
European/International Regulations	

European Labeling in Accordance with EC Directives

Hazard Symbols: XN

Risk Phrases:

- R 10 Flammable.
- R 22 Harmful if swallowed.
- R 37/38 Irritating to respiratory system and skin.
- R 41 Risk of serious damage to eyes.
- R 67 Vapours may cause drowsiness and dizziness.

Safety Phrases:

- S 7/9 Keep container tightly closed and in a well-ventilated place.
- S 13 Keep away from food, drink and animal feeding stuffs.
- S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- S 37/39 Wear suitable gloves and eye/face protection.
- S 46 If swallowed, seek medical advice immediately and show this container or label.

WGK (Water Danger/Protection)

CAS# 71-36-3: 1

Canada

CAS# 71-36-3 is listed on Canada's DSL List

Canadian WHMIS Classifications: Not available

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all of the information required by those regulations.

CAS# 71-36-3 is listed on Canada's Ingredient Disclosure List

Section 16 - Other Information

MSDS Creation Date: 6/10/1999

Revision #8 Date 4/07/2004

Revisions were made in Sections: 9

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall the company be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential, or exemplary damages howsoever arising, even if the company has been advised of the possibility of such damages.