

Material Safety Data Sheet



N-Butyl Alcohol (n-Butanol)

Section 1. Chemical product and company identification

Product Name	: N-Butyl Alcohol (n-Butanol)
Supplier	: AIRGAS INC., on behalf of its subsidiaries 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Synonym	: n-butyl alcohol; butyl alcohol; propyl carbinol
Material uses	: Other non specified industry: PREPARATION OF ESTERS, ESPECIALLY BUTYL ACETATE; SOLVENT FOR RESINS AND COATINGS; PLASTICIZERS; DYEING ASSISTANT; HYDRAULIC FLUIDS; DETERGENT FORMULATIONS; DEHYDRATING AGENT (BY AZEOTROPIC DISTILLATION); INTERMEDIATE; "BUTYLATED" MELAMINE RESINS; GLYCOL ETHERS; BUTYL ACRYLATE.
MSDS#	: 001157
Date of Preparation/Revision	: 6/11/2007.
In case of emergency	: 1-866-734-3438

Section 2. Hazards identification

Physical state	: Liquid. (COLORLESS, WATERY LIQUID WITH ALCOHOL ODOR)
Emergency overview	: Warning! CAUSES DAMAGE TO THE FOLLOWING ORGANS: MUCOUS MEMBRANES, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA. FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. MAY BE HARMFUL IF SWALLOWED. Do not ingest. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling.
Routes of entry	: Dermal contact. Eye contact. Inhalation.
Potential acute health effects	
Eyes	: Irritating to eyes.
Skin	: Practically non-toxic in contact with skin.
Inhalation	: Practically non-toxic by inhalation.
Ingestion	: Harmful if swallowed.
Potential chronic health effects	: CARCINOGENIC EFFECTS Not available. MUTAGENIC EFFECTS Not available. TERATOGENIC EFFECTS : Not available.
Medical conditions aggravated by overexposure	: Repeated or prolonged exposure is not known to aggravate medical condition.

See toxicological Information (section 11)

Section 3. Composition, Information on Ingredients

United States

butan-1-ol 71-36-3 100

Exposure limits

ACGIH TLV (United States, 1/2005). Notes: 2002 Adoption.

TWA: 20 ppm 8 hour(s). Form: All forms

NIOSH REL (United States, 12/2001). Skin

CEIL: 150 mg/m³ Form: All forms

CEIL: 50 ppm Form: All forms

OSHA PEL (United States, 8/1997).

TWA: 300 mg/m³ 8 hour(s). Form: All forms

TWA: 100 ppm 8 hour(s). Form: All forms

Section 4. First aid measures

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation occurs.
- Skin contact** : Wash with soap and water. Get medical attention if irritation develops.
- 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.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Section 5. Fire fighting measures

- Flammability of the product** : Flammable.
- Auto-ignition temperature** : 342.85°C (649.1°F)
- Flash point** : Closed cup: 28.85°C (83.9°F).
- Flammable limits** : Lower: 1.4% Upper: 11.2%
- Products of combustion** : These products are carbon oxides (CO, CO₂).
- Fire fighting media and instructions** : In case of fire, use water spray (fog), foam, dry chemicals, or CO₂.

Flammable liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.

- Special protective equipment for fire-fighters** : Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Do not touch or walk through spilled material.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : If emergency personnel are unavailable, contain spilled material. For small spills add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion proof means to transfer material to a sealed, appropriate container for disposal. For large spills dike spilled material or otherwise contain material to ensure runoff does not reach a waterway. Place spilled material in an appropriate container for disposal.

Section 7. Handling and storage

- Handling** : Do not ingest. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling.
- 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).

Section 8. Exposure Controls, Personal Protection

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

Personal protection

- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

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- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- 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.

Product name

United States

butan-1-ol

Exposure limits

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TWA: 100 ppm 8 hour(s). Form: All forms

Section 9. Physical and chemical properties

- Physical state** : Liquid. (COLORLESS, WATERY LIQUID WITH ALCOHOL ODOR)
- Odor** : CHARACTERISTIC; MILDLY ALCOHOLIC, NON RESIDUAL
- Molecular weight** : 74.14 g/mole
- Molecular formula** : C₄H₁₀O
- Boiling/condensation point** : 117.78°C (244°F)
- Melting/freezing point** : -88.88°C (-128°F)
- Critical temperature** : 289.9°C (553.8°F)
- Specific gravity** : 0.81 (Water = 1)
- Vapor pressure** : 0.5 kPa (4 mm Hg) (at 20°C)
- Vapor density** : 2.6 (Air = 1)
- Evaporation rate** : 0.44 compared to Butyl acetate.

Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
- Incompatibility with various substances** : Highly reactive with oxidizing agents.

Section 11. Toxicological information

Toxicity data

Ingredient name

butan-1-ol

Test

LD50

LD50

LD50

LD50

LDLo

LC50

Result

790 mg/kg

3484 mg/kg

2500 mg/kg

3400 mg/kg

1760 mg/kg

16000 ppm (1
hour(s))

Route

Oral

Oral

Oral

Dermal

Oral

Inhalation

Species

Rat

Rabbit

wild bird species

Rabbit

Dog

Rat

IDLH : 1400 ppm

Chronic effects on humans : Causes damage to the following organs: mucous membranes, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

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Other toxic effects on humans : Very hazardous in case of eye contact (irritant).
Hazardous in case of skin contact (irritant), of inhalation (lung irritant).

Specific effects

Carcinogenic effects : No known significant effects or critical hazards.

Mutagenic effects : No known significant effects or critical hazards.

Reproduction toxicity : No known significant effects or critical hazards.

Section 12. Ecological information

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
butan-1-ol	Daphnia magna (EC50)	48 hour(s)	1983 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	100 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1730 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1910 mg/l
	Pimephales promelas (LC50)	96 hour(s)	1940 mg/l

Products of degradation : These products are carbon oxides (CO, CO₂) and water.




Toxicity of the products of biodegradation : The products of degradation are less toxic than the product itself.

Section 13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements.

Consult your local or regional authorities.

Section 14. Transport information

<u>Regulatory information</u>	<u>UN number</u>	<u>Proper shipping name</u>	<u>Class</u>	<u>Packing group</u>	<u>Label</u>	<u>Additional information</u>
DOT Classification	UN1120	Butanols (butan-1-ol)	3	II		Reportable quantity 5000 lbs. (2268 kg)
TDG Classification	UN1120	Butanols (butan-1-ol)	3	II		Explosive Limit and Limited Quantity Index 1 Passenger Carrying Road or Rail Index 5
Mexico Classification	UN1120	Butanols (butan-1-ol)	3	II		Reportable quantity 5000 lbs. (2268 kg)

Section 15. Regulatory information

United States

- HCS Classification** : Flammable liquid
Target organ effects
- U.S. Federal regulations** : TSCA 8(b) inventory: butan-1-ol
SARA 302/304/311/312 extremely hazardous substances: No products were found.
SARA 302/304 emergency planning and notification: No products were found.
SARA 302/304/311/312 hazardous chemicals: butan-1-ol
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: butan-1-ol:
Fire hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: No products were found.
Clean air act (CAA) 112 regulated flammable substances: No products were found.
Clean air act (CAA) 112 regulated toxic substances: No products were found.

SARA 313

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Form R - Reporting requirements	: butan-1-ol	71-36-3	100
Supplier notification	: butan-1-ol	71-36-3	100

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

- State regulations** : Pennsylvania RTK: butan-1-ol: (environmental hazard, generic environmental hazard)
Massachusetts RTK: butan-1-ol
New Jersey: butan-1-ol

Canada

- WHMIS (Canada)** : Class B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
Class D-2B: Material causing other toxic effects (TOXIC).
CEPA DSL: butan-1-ol

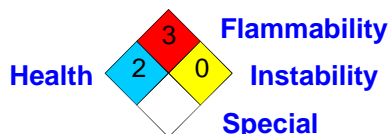
Section 16. Other information

- Label Requirements** : CAUSES DAMAGE TO THE FOLLOWING ORGANS: MUCOUS MEMBRANES, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.
MAY BE HARMFUL IF SWALLOWED.

Hazardous Material Information System (U.S.A.) :

Health	*	2
Fire hazard		3
Reactivity		0
Personal protection		C

National Fire Protection Association (U.S.A.) :



Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.