



SAFETY DATA SHEET

n-Butanol

According to Appendix D, OSHA Hazard Communication Standard 29 CFR §1910.1200

1. Identification

Product identifier

Product name	n-Butanol
Product number	n-Butanol
Synonyms; trade names	butan-1-ol, n-butanol
CAS number	71-36-3

Recommended use of the chemical and restrictions on use

Application	Industrial solvent. Manufacture of substance
Uses advised against	Use only for intended applications.

Details of the supplier of the safety data sheet

Supplier	The Chemical Supply 9595 Six Pine Dr. Ste 8210 The Woodlands, TX 77380 info@thechemicalsupply.com
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Emergency telephone number 24/7 Worldwide Emergency Telephone: CHEMTREC on +1 703-741-5970 / +1-800-424-9300.

Emergency telephone 24/7 Worldwide Emergency Telephone Number for Hazardous Materials Incident, Spill, Leak, Fire, Exposure or Accident: CHEMTREC on +1 703-741-5970 / +1-800-424-9300.

National emergency telephone number

2. Hazard(s) identification

Classification of the substance or mixture

Physical hazards	Flam. Liq. 3 - H226
Health hazards	Acute Tox. 4 - H302 Skin Irrit. 2 - H315 Eye Dam. 1 - H318 STOT SE 3 - H335, H336
Environmental hazards	Not Classified

n-Butanol

Human health May cause serious eye damage. The liquid may be irritating to skin. Gas or vapor in high concentrations may irritate the respiratory system.

Environmental The product is not expected to be hazardous to the environment.

Label elements

Hazard symbols



Signal word Danger

Hazard statements H226 Flammable liquid and vapor.
H302 Harmful if swallowed.
H315 Causes skin irritation.
H318 Causes serious eye damage.
H335 May cause respiratory irritation.
H336 May cause drowsiness or dizziness.

Precautionary statements P210 Keep away from heat, sparks, open flames and hot surfaces. No smoking.
P240 Ground/ bond container and receiving equipment.
P241 Use explosion-proof electrical equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.
P261 Avoid breathing vapor/ spray.
P264 Wash contaminated skin thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301+P312 If swallowed: Call a poison center/ doctor if you feel unwell.
P302+P352 If on skin: Wash with plenty of water.
P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/ shower.
P304+P340 If inhaled: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a poison center/ doctor.
P321 Specific treatment (see medical advice on this label).
P330 Rinse mouth.
P332+P313 If skin irritation occurs: Get medical advice/ attention.
P362+P364 Take off contaminated clothing and wash it before reuse.
P370+P378 In case of fire: Use foam, carbon dioxide, dry powder or water fog to extinguish.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.
P501 Dispose of contents/ container in accordance with national regulations.

Contains BUTANOLS

Other hazards

No information available

3. Composition/information on ingredients

Mixtures

n-Butanol

BUTANOLS	99.8% Min
CAS number: 71-36-3	
Classification	
Flam. Liq. 3 - H226	
Acute Tox. 4 - H302	
Skin Irrit. 2 - H315	
Eye Dam. 1 - H318	
STOT SE 3 - H335, H336	
Water	0.1% Max
CAS number: —	
Classification	
Not Classified	
ISO-BUTANOL	0.1% Max
CAS number: 78-83-1	
Classification	
Flam. Liq. 3 - H226	
Skin Irrit. 2 - H315	
Eye Dam. 1 - H318	
STOT SE 3 - H335, H336	

The full text for all hazard statements is displayed in Section 16.

4. First-aid measures

Description of first aid measures

General information	Get medical attention if any discomfort continues.
Inhalation	Remove affected person from source of contamination. Place unconscious person on their side in the recovery position and ensure breathing can take place. Get medical attention.
Ingestion	Do not induce vomiting. Give plenty of water to drink. Never give anything by mouth to an unconscious person. Get medical attention immediately.
Skin Contact	Remove contaminated clothing. Wash skin thoroughly with soap and water. Get medical attention if any discomfort continues.
Eye contact	Remove any contact lenses and open eyelids wide apart. Rinse immediately with plenty of water. Continue to rinse for at least 15 minutes. Get medical attention immediately.

Most important symptoms and effects, both acute and delayed

Inhalation	Vapors have a narcotic effect. Vapors may cause headache, fatigue, dizziness and nausea.
Ingestion	Harmful if swallowed.
Skin contact	Skin irritation. Prolonged contact may cause redness, irritation and dry skin.
Eye contact	Serious eye damage

Indication of immediate medical attention and special treatment needed

Notes for the doctor	Treat symptomatically.
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5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media Stop flow of material to fire. Extinguish with alcohol-resistant foam, carbon dioxide, dry powder or water fog.

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Special hazards arising from the substance or mixture

Flammability Class Flammable liquid

Specific hazards The product is flammable.

Advice for firefighters

Protective actions during firefighting Avoid breathing fire gases or vapors. Use water to keep fire exposed containers cool and disperse vapors. Do not use water jet as an extinguisher, as this will spread the fire. Vapors are heavier than air and may spread near ground and travel a considerable distance to a source of ignition and flash back. Vapors may form explosive mixtures with air. Control run-off water by containing and keeping it out of sewers and watercourses.

Special protective equipment for firefighters Containers close to fire should be removed or cooled with water. Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Personal precautions Provide adequate ventilation. Evacuate area. Do not breathe vapour/spray. No smoking, sparks, flames or other sources of ignition near spillage. Wear protective clothing as described in Section 8 of this safety data sheet.

Environmental precautions

Environmental precautions Avoid the spillage or runoff entering drains, sewers or watercourses. Do not discharge into drains or watercourses or onto the ground. Spillages or uncontrolled discharges into watercourses must be reported immediately to the Environmental Agency or other appropriate regulatory body.

Methods and material for containment and cleaning up

Methods for cleaning up Stop leak if safe to do so.
Small Spillages: Absorb spillage with non-combustible, absorbent material. Absorb in vermiculite, dry sand or earth and place into containers.
Large Spillages: If a leak or spill has not ignited, use water spray to disperse vapors and protect men stopping the leak. Use water spray to dilute spill to a nonflammable mixture. Residues and empty containers should be taken care of as hazardous waste according to local and national provisions. The requirements of the local water authority must be complied with if contaminated water is flushed directly to the sewer.

Reference to other sections For personal protection, see Section 8. For waste disposal, see Section 13.

7. Handling and storage

Precautions for safe handling

Usage precautions Avoid inhalation of vapors. Avoid contact with skin and eyes. Keep away from heat, sparks and open flame. Static electricity and formation of sparks must be prevented. Use explosion-proof electrical equipment. Provide adequate ventilation. Good personal hygiene procedures should be implemented. Wash hands thoroughly after handling.

Conditions for safe storage, including any incompatibilities

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Storage precautions	Store in tightly-closed, original container in a dry, cool and well-ventilated place. Keep away from heat, sparks and open flame. Store away from the following materials: Oxidizing materials.
Storage class	Flammable liquid storage.
Specific end uses(s)	
Specific end use(s)	The identified uses for this product are detailed in Section 1.
Usage description	Ground container and transfer equipment to eliminate sparks from static electricity.

8. Exposure controls/Personal protection

Control parameters

Occupational exposure limits

Long-term exposure limit (8-hour TWA): OSHA 100 ppm 300 mg/m³

Long-term exposure limit (8-hour TWA): ACGIH 20 ppm 61 mg/m³

BUTANOLS

Long-term exposure limit (8-hour TWA): OSHA 100 ppm 300 mg/m³

Long-term exposure limit (8-hour TWA): ACGIH 20 ppm 61 mg/m³

ISO-BUTANOL

Long-term exposure limit (8-hour TWA): OSHA 100 ppm 300 mg/m³

Long-term exposure limit (8-hour TWA): ACGIH 50 ppm 152 mg/m³

OSHA = Occupational Safety and Health Administration.

ACGIH = American Conference of Governmental Industrial Hygienists.

BUTANOLS (CAS: 71-36-3)

Ingredient comments

WEL = Workplace Exposure Limits

Exposure controls

Protective equipment



Appropriate engineering controls

This product must not be handled in a confined space without adequate ventilation. Provide adequate ventilation.

Eye/face protection

Chemical splash goggles and face shield. Personal protective equipment for eye and face protection should comply with OSHA 1910.133.

Hand protection

The most suitable glove should be chosen in consultation with the glove supplier/manufacturer, who can provide information about the breakthrough time of the glove material. The breakthrough time for any glove material may be different for different glove manufacturers. To protect hands from chemicals, gloves should comply with OSHA 1910.138 and be demonstrated to be impervious to the chemical and resist degradation. Wear protective gloves made of the following material: Butyl rubber. Nitrile rubber.

Other skin and body protection

Wear suitable protective clothing as protection against splashing or contamination.

Hygiene measures

Provide eyewash station and safety shower. Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly with soap and water if skin becomes contaminated. Do not smoke in work area.

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Respiratory protection	If ventilation is inadequate, suitable respiratory protection must be worn. Respirator selection must be based on exposure levels, the hazards of the product and the safe working limits of the selected respirator. Ensure all respiratory protective equipment is suitable for its intended use and is NIOSH approved. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.
Environmental exposure controls	Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. Residues and empty containers should be taken care of as hazardous waste according to local and national provisions. Store in a demarcated bunded area to prevent release to drains and/or watercourses.
Immediate danger to life and health	1400 ppm

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance	Clear liquid.
Color	Colorless.
Odor	Alcoholic.
Odor threshold	0.83 ppm
pH	Data lacking.
Melting point	-89.5°C/-129.1°F
Initial boiling point and range	117.7°C/243.8°F
Flash point	36°C/96.8°F Closed cup.
Evaporation rate	0.5 (butyl acetate = 1)
Upper/lower flammability or explosive limits	Upper flammable/explosive limit: 11.3 Vol % Lower flammable/explosive limit: 1.5 Vol %
Vapor pressure	4.4 mm Hg @ 20°C/68°F
Vapor density	2.56
Relative density	Not available. 0.81 (H ₂ O=1) @ 20°C/68°F
Solubility(ies)	80 g/l water @ 20°C/68°F
Auto-ignition temperature	343°C/694.4°F (ASTM D2155)
Viscosity	3 mPa s @ 20°C/68°F
Refractive index	1.390 - 1.400
Molecular weight	CH ₃ (CH ₂) ₃ OH 74.12

10. Stability and reactivity

Reactivity	No specific test data related to reactivity available for this product
Stability	Stable at normal ambient temperatures and when used as recommended. Will not polymerize.

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Possibility of hazardous reactions	Under normal conditions of storage and use, no hazardous reactions will occur.
Conditions to avoid	Avoid heat, flames and other sources of ignition. Avoid excessive heat for prolonged periods of time.
Materials to avoid	Strong oxidizing agents.
Hazardous decomposition products	Thermal decomposition or combustion products may include the following substances: Carbon dioxide (CO ₂). Carbon monoxide (CO).

11. Toxicological information

Information on toxicological effects

Toxicological effects Harmful by inhalation. Pre-existing medical conditions of the skin or respiratory system may be aggravated by exposure to this material Harmful if swallowed. Repeated exposure may cause skin dryness or cracking. Causes serious eye damage.

Acute toxicity - oral

Acute toxicity oral (LD₅₀ mg/kg) 790.0

Species Rat

Notes (oral LD₅₀) LD₅₀ 790 mg/kg, Oral, Rat

ATE oral (mg/kg) 790.0

Acute toxicity - dermal

Notes (dermal LD₅₀) LD₅₀ 5620 mg/kg, Dermal, Rabbit

Acute toxicity - inhalation

Notes (inhalation LC₅₀) LC₅₀ >17.90 mg/l, Inhalation, Rat

Skin corrosion/irritation

Animal data Irritating.

Serious eye damage/irritation

Serious eye damage/irritation Causes serious eye damage.

Germ cell mutagenicity

Genotoxicity - in vitro Not available.

Genotoxicity - in vivo Not available.

Carcinogenicity

Carcinogenicity Not available.

Reproductive toxicity

Reproductive toxicity - fertility Not available.

Reproductive toxicity - development Not available.

Specific target organ toxicity - single exposure

STOT - single exposure Not available.

Specific target organ toxicity - repeated exposure

STOT - repeated exposure Not available.

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Inhalation	Vapors may irritate throat/respiratory system. Symptoms following overexposure may include the following: Headache. Dizziness. Drowsiness.
Skin Contact	Irritating to skin.
Eye contact	Severe irritation, burning and tearing.
Route of exposure	Skin and/or eye contact Inhalation Skin absorption

12. Ecological information

Ecotoxicity	The product is not expected to be hazardous to the environment.
<u>Acute aquatic toxicity</u>	
Acute toxicity - fish	LC50, 96 hours: 1376 mg/l, Pimephales promelas (Fat-head Minnow)
Acute toxicity - aquatic invertebrates	, 48 hours: 1328 mg/l, Daphnia magna
Acute toxicity - aquatic plants	Not available.
Acute toxicity - microorganisms	Not available.
Acute toxicity - terrestrial	Not available.
<u>Persistence and degradability</u>	
Persistence and degradability	No data available.
Biodegradation	No data available.
<u>Bioaccumulative potential</u>	
Bio-Accumulative Potential	No data available on bioaccumulation.
<u>Mobility in soil</u>	
Mobility	The product is soluble in water.
Adsorption/desorption coefficient	Not available.
Henry's law constant	Not available.
Surface tension	Not available.
<u>Other adverse effects</u>	
Other adverse effects	None known.

13. Disposal considerations

Waste treatment methods

General information	The generation of waste should be minimized or avoided wherever possible. Waste is classified as hazardous waste. External recovery, treatment, recycling and disposal of waste should comply with all applicable local and/or national regulations. Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority.
Disposal methods	Dispose of waste to licensed waste disposal site in accordance with the requirements of the local Waste Disposal Authority. Dispose of waste via a licensed waste disposal contractor.

14. Transport information

n-Butanol**UN Number**

UN No. (TDG)	1120
UN No. (IMDG)	1120
UN No. (ICAO)	1120
UN No. (DOT)	UN1120

UN proper shipping name

Proper shipping name (TDG)	BUTANOLS
Proper shipping name (IMDG)	BUTANOLS
Proper shipping name (ICAO)	BUTANOLS
Proper shipping name (DOT)	BUTANOLS

Transport hazard class(es)

DOT hazard class	3
DOT hazard label	3
TDG class	3
TDG label(s)	3
IMDG Class	3
ICAO class/division	3

Transport labels**DOT transport labels****Packing group**

TDG Packing Group	II
IMDG packing group	II
ICAO packing group	II
DOT packing group	III

Environmental hazards**Environmentally Hazardous Substance**

No.

Special precautions for user

EmS F-E, S-D

DOT reportable quantity RQ: n-Butyl alcohol (5010.02 lbs), RQ: Isobutyl alcohol (5000000 lbs)

15. Regulatory information

n-Butanol

US Federal Regulations

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)

BUTANOLS

ISO-BUTANOL

SARA 313 Emission Reporting

1.0 %

BUTANOLS

US State Regulations

California Air Toxics "Hot Spots" (A-I)

Present.

BUTANOLS

California Directors List of Hazardous Substances

Present.

BUTANOLS

ISO-BUTANOL

Massachusetts "Right To Know" List

Present.

BUTANOLS

ISO-BUTANOL

Rhode Island "Right To Know" List

Present.

BUTANOLS

ISO-BUTANOL

Minnesota "Right To Know" List

Present.

BUTANOLS

ISO-BUTANOL

New Jersey "Right To Know" List

Present.

BUTANOLS

ISO-BUTANOL

Pennsylvania "Right To Know" List

Present.

BUTANOLS

ISO-BUTANOL

Inventories

EU - EINECS/ELINCS

All the ingredients are listed or exempt.

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Canada - DSL/NDSL

DSL

All the ingredients are listed or exempt.

US - TSCA

All the ingredients are listed or exempt.

BUTANOLS

ISO-BUTANOL

Australia - AICS

All the ingredients are listed or exempt.

Japan - ENCS

All the ingredients are listed or exempt.

Korea - KECI

All the ingredients are listed or exempt.

Philippines - PICCS

All the ingredients are listed or exempt.

New Zealand - NZIOC

All the ingredients are listed or exempt.

Taiwan - TCSI

All the ingredients are listed or exempt.

16. Other information

Revision comments	New issue in new format
Issued by	The Chemical Supply
Revision date	1/8/2020
Revision	1
Supersedes date	11/7/2017
SDS No.	22578
SDS status	Approved.
Hazard statements in full	H226 Flammable liquid and vapor. H302 Harmful if swallowed. H315 Causes skin irritation. H318 Causes serious eye damage. H335 May cause respiratory irritation. H336 May cause drowsiness or dizziness.
NFPA - health hazard	Temporary incapacitation, injury. (2)
NFPA - flammability hazard	Ignites easily. (3)
NFPA - instability hazard	Normally stable. (0)
ACA HMIS Health rating.	Moderate hazard. (2)
ACA HMIS Flammability rating.	Ignites easily. (3)

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ACA HMIS Physical hazard rating. Normally stable. (0)

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.