

SAFETY DATA SHEETS



Version: 1.1
Creation Date: November 12, 2024
Revision Date: September 05, 2025

SECTION 1: Identification

1.1 GHS Product identifier

Product name RENEWABLE N-BUTANOL

1.2 Other means of identification

Product number -
Other names Bio-Butanol, Bio-based Butanol, n-Butanol

1.3 Recommended use of the chemical and restrictions on use

Identified uses Solvent, fuel additive, intermediate in chemical synthesis
Uses advised against Not for pharmaceutical or food applications without further purification.

1.4 Supplier's details

Company NUOL Green Chemistry
Address Heron Road, 17936 – Little Falls/MS - USA
Telephone -----

1.5 Emergency phone number

Emergency phone number -----
Service hours Monday to Friday, 9am-5pm (Standard time zone: CST / UTC-6).

SECTION 2: Hazard identification

2.1 Classification of the substance or mixture

Flammable Liquids (Category 3) - Eye Irritation (Category 2A) - Specific Target Organ Toxicity — Single Exposure (Category 3, Narcotic Effects)

2.2 GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Warning

Hazard statement(s)

H226: Flammable liquid and vapor
H319: Causes serious eye irritation
H336: May cause drowsiness or dizziness

Precautionary statement(s)

Prevention

Wash hands and face thoroughly after handling. Take off contaminated clothing and wash it before reusing.
Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

Response

If on skin wash with plenty of water. If skin irritation occurs: Get medical help.
Keep away from heat/sparks/open flames/hot surfaces – No smoking
If in eyes, rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage

Store in a well-ventilated place. Keep container tightly closed.

Disposal

Dispose of contents/container in accordance with local regulations.

2.3 Other hazards which do not result in classification

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name	Common names and synonyms	CAS number	EC number	Concentration	Chemical Formula
RENEWABLE N-BUTANOL	Bio-Butanol, Bio-based Butanol, n-Butanol	71-36-3	200-751-6	≥ 99.5%	C ₄ H ₁₀ O

SECTION 4: First-aid measures

4.1 Description of necessary first-aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical. Consult a doctor.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse cautiously with pure water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

4.2 Most important symptoms/effects, acute and delayed

Drowsiness, dizziness, eye and respiratory irritation.

4.3 Indication of immediate medical attention and special treatment needed, if necessary

no data available

SECTION 5: Fire-fighting measures

5.1 Suitable extinguishing media

Alcohol-resistant foam, dry chemical powder, CO₂, water spray.

5.2 Specific hazards arising from the chemical

Carbon oxides. Combustible. Vapors are heavier than air and may spread along floors. Forms explosive mixtures with air on intense heating. Development of hazardous combustion gases or vapours possible in the event of fire. Containers may explode when heated.

5.3 Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary. Fire-extinguishing work is done from the windward and the suitable fire-extinguishing method according to the surrounding situation is used. Uninvolved people should evacuate to a safe place. In case of fire in the surroundings: Remove movable containers if safe to do so. When extinguishing fire, be sure to wear personal protective equipment. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

6.2 Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

6.3 Methods and materials for containment and cleaning up

Collect and arrange disposal. Cover drains. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Soak up with inert absorbent material and dispose of as hazardous waste accordance to regulations. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations. Clean up affected area.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Handling in a well-ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam. Keep away from open flames, hot surfaces and sources of ignition.

7.2 Conditions for safe storage, including any incompatibility

Do not contaminate water, food, or feed by storage. Keep container tightly sealed when not in use. Store in a cool, well-ventilated place. Keep container tightly closed. Keep away from incompatible materials (oxidizers, acids).

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure limit values

Butanol (OSHA PEL: 100 ppm (300 mg/m³ | ACGIH TLV: 20 ppm TWA)

Biological limit values

no data available

8.2 Appropriate engineering controls

Ensure adequate ventilation (explosion-proof ventilation.). Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area. Also install safety shower and eye bath. Wash hands before breaks and at the end of workday.

8.3 Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Handle with chemical-resistant gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands.

Respiratory protection

Where risk assessment shows air-purifying respirators are appropriate use a full-face respirator with multi-purpose combination (US) or type ABEK (EN 14387) respirator cartridges as a backup to engineering controls. If the respirator is the sole means of protection, use a full-face supplied air respirator. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

SECTION 9: Physical and chemical properties

Physical state (20°C)	Liquid
Form	Liquid
Colour	Clear, Colorless
Odor	Alcohol-like, sweet
Melting point/freezing point	-89 °C
Boiling point or initial boiling point and boiling range	117 °C
Flammability	Highly flammable
Lower and upper explosion limit/flammability limit	no data available
Flash point	35 °C (Closed cup)
Auto-ignition temperature	343 °C
Decomposition temperature	no data available
pH	Neutral
Viscosity	~ 2.95 mPa·s at 20 °C
Solubility	Moderate in water
Partition coefficient (log Kow)	-0,88
Vapour pressure	~ 6.7 mmHg at 20°C
Density and/or relative density	0.81 g/cm ³ at 20 °C
Relative vapour density	~2.6 (air =1)
Particle characteristics	no data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reactions under normal conditions.

10.2 Chemical stability

The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions

May form explosive peroxides upon prolonged exposure to air.

10.4 Conditions to avoid

Avoid moisture. Strong heating

10.5 Incompatible materials

Oxidizing agents, acids, bases.

10.6 Hazardous decomposition products

Carbon monoxide, carbon dioxide.

SECTION 11: Toxicological information

Acute toxicity

- LD50 Oral (rat): 790 mg/kg
- LC50 Inhalation (rat): 24.6 mg/L (4h)

Skin corrosion/irritation

Mild irritant.

Serious eye damage/irritation

Causes eye irritation.

Carcinogenicity

Not classified as carcinogenic (IARC, NTP, OSHA).

Reproductive toxicity

No data available

STOT-single exposure

May cause drowsiness or dizziness.

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

12.1 Toxicity

Fish (LC50): ~ 1,370 mg/L (Lepomis macrochirus)
Invertebrates (EC50): ~ 2,320 mg/L

12.2 Persistence and degradability

Readily biodegradable.

12.3 Bioaccumulative potential

Low (log Kow <1).

12.4 Mobility in soil

High mobility.

12.5 Other adverse effects

no data available

SECTION 13: Disposal considerations

13.1 Disposal methods

Product

Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer and drain systems. Do not release to the environment.

Contaminated packaging

Dispose of contents/container in accordance with local/regional/national/international regulations.

SECTION 14: Transport information

14.1 UN Number

UN1120

14.2 UN Proper Shipping Name

Butanol or n-Butanol

14.3 Transport hazard class(es)

3 (Flammable Liquid)

14.4 Packing group, if applicable

III

14.5 Environmental hazards

Not a marine pollutant.

14.6 Special precautions for user

no data available

14.7 Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations specific for the product in question

Chemical name	Common names and synonyms	CAS number	EC number	Chemical Formula
RENEWABLE N-BUTANOL	Bio-Butanol, Bio-based Butanol, n-Butanol	71-36-3	200-751-6	C ₄ H ₁₀ O
United States Toxic Substances Control Act (TSCA) Inventory: Listed			REACH: Listed	SARA 313: Not Listed

This safety datasheet complies with the requirements of Regulation (EC) No. 1907/2006.
For this product a chemical safety assessment was not carried out.

SECTION 16: Other information

Information on revision

Creation Date November 12, 2024
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Prepared by NUOL Green Chemistry LLC.

Full text of H-Statements

H226: Flammable liquid and vapor

H319: Causes serious eye irritation

H336: May cause drowsiness or dizziness

Disclaimer: The information provided in this SDS is believed to be accurate and represents the best information currently available. However, no warranty of merchantability or fitness for any particular purpose is expressed or implied.

Abbreviations and acronyms

- CAS: Chemical Abstracts Service
- ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
- RID: Regulation concerning the International Carriage of Dangerous Goods by Rail
- IMDG: International Maritime Dangerous Goods
- IATA: International Air Transportation Association
- TWA: Time Weighted Average
- STEL: Short term exposure limit
- LC50: Lethal Concentration 50%
- LD50: Lethal Dose 50%
- EC50: Effective Concentration 50%

References

- IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>
- HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>
- IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>
- eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en
- CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>
- ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>
- ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>
- Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>
- ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>