



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	n-BUTYL ALCOHOL
Version #	02
Revision date	08-26-2011
CAS #	71-36-3
Product Codes	J.T.Baker: 9054, 9189 Macron: 2978, 3000
Synonym(s)	1-Butanol; propyl carbinol; butanol; butyl alcohol, normal
Manufacturer	Avantor Performance Materials, Inc.
Address	3477 Corporate Parkway Suite #200 Center Valley, PA 18034 US
Customer Service	855-282-6867
24 Hour Emergency	908-859-2151
Chemtrec	800-424-9300

2. Hazards Identification

Emergency overview	DANGER Flammable liquid and vapor. May be ignited by heat, sparks or flames. Harmful if swallowed - may enter lungs if swallowed or vomited. Causes eye burns. Irritating to respiratory system and skin. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract. Prolonged exposure may cause chronic effects.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.
Eyes	Causes eye burns. High vapor/aerosol concentrations may be irritating.
Skin	May be harmful if absorbed through skin. Causes skin irritation. Prolonged or repeated contact with skin may cause redness, itching, irritation and eczema/chapping.
Inhalation	May be harmful if inhaled. May cause irritation to the mucous membranes and upper respiratory tract. In high concentrations, vapors and aerosol mists have a narcotic effect and may cause headache, fatigue, dizziness and nausea.
Ingestion	Harmful if swallowed. Irritating. May cause nausea, stomach pain and vomiting. Ingestion may result in vomiting; aspiration (breathing) of vomitus into lungs must be avoided as even small quantities may result in aspiration pneumonitis.
Target organs	Eyes. Skin. Respiratory system. Central nervous system. Blood.
Chronic effects	Organic solvents may be absorbed into the body by inhalation and cause permanent damage to the nervous system, including the brain. Risk of damage to blood system. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.
Potential environmental effects	The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
n-BUTYL ALCOHOL	71-36-3	99 - 100

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Call a physician or poison control center immediately. In case of irritation from airborne exposure, move to fresh air. Get medical attention immediately.
Skin contact	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention if irritation develops or persists. Wash contaminated clothing before reuse. Destroy or thoroughly clean contaminated shoes.
Inhalation	Move to fresh air. If breathing is difficult, give oxygen. If breathing stops, provide artificial respiration. Get medical attention.
Ingestion	Call a physician or poison control center immediately. Do not induce vomiting. If vomiting occurs, the head should be kept low so that stomach vomit doesn't enter the lungs.

Notes to physician

Treat symptomatically.

General advice

Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire Fighting Measures

Flammable properties

FLAMMABLE. Vapors may cause a flash fire or ignite explosively. Vapors may travel considerable distance to a source of ignition and flash back. Heat may cause the containers to explode.

Extinguishing media

Suitable extinguishing media Water spray. Foam. Dry powder. Carbon dioxide (CO₂).

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

Protection of firefighters

Specific hazards arising from the chemical Can be ignited easily and burns vigorously. Vapor from the solvent may accumulate in container headspace resulting in flammability hazard.

Protective equipment and precautions for firefighters Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Move containers from fire area if you can do so without risk. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out. Some of these materials, if spilled, may evaporate leaving a flammable residue. Cool containers exposed to flames with water until well after the fire is out.

Special protective equipment for fire-fighters As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Specific methods In the event of fire and/or explosion do not breathe fumes. Use water spray to cool unopened containers.

Hazardous combustion products Carbon monoxide and carbon dioxide.

6. Accidental Release Measures

Personal precautions Wear appropriate protective equipment and clothing during clean-up. Keep unnecessary personnel away. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained.

Environmental precautions Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

Methods for containment ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Prevent entry into waterways, sewer, basements or confined areas. Dike the spilled material, where this is possible.

Methods for cleaning up

Use only non-sparking tools. All equipment used when handling the product must be grounded.

Large Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Dike far ahead of spill for later disposal.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Collect in a non-combustible container for prompt disposal.

Never return spills in original containers for re-use. Clean surface thoroughly to remove residual contamination. Clean up in accordance with all applicable regulations.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

7. Handling and Storage

Handling

DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Take precautionary measures against static discharges. Wear appropriate personal protective equipment. Do not breathe mist or vapor. Do not get in eyes and avoid contact with skin and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. See Section 8 of the MSDS for Personal Protective Equipment.

Storage

Keep away from food, drink and animal feedingstuffs. Keep out of the reach of children. Keep container tightly closed in a cool, well-ventilated place. Ground container and transfer equipment to eliminate static electric sparks. Comply with all national, state, and local codes pertaining to the storage, handling, dispensing, and disposal of flammable liquids.

8. Exposure Controls / Personal Protection

ACGIH

Material

Type

Value

n-BUTYL ALCOHOL (71-36-3)

TWA

20.0000 ppm

Occupational exposure limits

U.S. - OSHA

Material

Type

Value

n-BUTYL ALCOHOL (71-36-3)

PEL

100.0000 ppm
300.0000 mg/m³

Engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Explosion proof exhaust ventilation should be used.

Personal protective equipment

Eye / face protection

Wear chemical goggles and face shield.

Skin protection

Wear appropriate chemical resistant clothing. Wear appropriate chemical resistant gloves.

Respiratory protection

If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn. Respirator type: Chemical respirator with organic vapor cartridge and full facepiece.

General hygiene considerations

Provide eyewash station and safety shower. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical & Chemical Properties

Appearance

Liquid.

Color

Colorless.

Odor

Alcoholic.

Odor threshold	Not available.
Physical state	Liquid.
Form	Liquid.
pH	Not available.
Melting point	-130 °F (-89.8 °C)
Freezing point	-130 °F (-89.8 °C)
Boiling point	244.4 °F (118 °C)
Flash point	98 °F (36.7 °C) Closed Cup
Evaporation rate	0.46 BuAc
Flammability limits in air, upper, % by volume	11.25 %
Flammability limits in air, lower, % by volume	1.45 %
Vapor pressure	0.93324 kPa at 25°C
Vapor density	2.6
Specific gravity	0.81 @ 20°C / 4°C
Relative density	Not available.
Solubility (water)	90 g/l
Partition coefficient (n-octanol/water)	0.88
Auto-ignition temperature	650 °F (343.3 °C)
VOC	100 %
Molecular weight	74.12 g/mol
Molecular formula	C4-H10-O

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions.
Conditions to avoid	Heat, sparks, flames.
Incompatible materials	Strong oxidizing agents. Strong mineral acids. Halogens. Aluminum. Alkali metals.
Hazardous decomposition products	At thermal decomposition temperatures, carbon monoxide and carbon dioxide.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Toxicological data

Product

n-BUTYL ALCOHOL (71-36-3)

Test Results

Acute Dermal LD50 Rabbit: 3400 mg/kg

Acute Inhalation LC50 Rat: 8000 mg/l 4.00 Hours

Acute Oral LD50 Rat: 790 mg/kg

Sensitization

Not a skin sensitizer.

Acute effects

Harmful if swallowed - may enter lungs if swallowed or vomited. May be harmful if absorbed through skin. May be harmful if inhaled.

Local effects

Causes eye burns. Causes skin irritation. Irritating to respiratory system. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract.

Chronic effects

Organic solvents may be absorbed into the body by inhalation and cause permanent damage to the nervous system, including the brain. Risk of damage to blood system. Frequent or prolonged contact may defat and dry the skin, leading to discomfort and dermatitis.

Carcinogenicity

This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Skin corrosion/irritation	Causes skin irritation.
Epidemiology	No epidemiological data is available for this product.
Mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Neurological effects	High vapor/aerosol concentrations (attainable only at elevated temperatures) may cause central nervous system effects such as dizziness, drowsiness or headaches. Central and/or peripheral nervous system damage.
Reproductive effects	Contains no ingredient listed as toxic to reproduction
Teratogenicity	No data available to indicate product or any components present at greater than 0.1% may cause birth defects.
Symptoms and target organs	Irritation. Drowsiness and dizziness.

12. Ecological Information

Ecotoxicological data

Product	Test Results
n-BUTYL ALCOHOL (71-36-3)	EC50 Water flea (Daphnia magna): 1897 mg/l 48.00 hours LC50 Fathead minnow (Pimephales promelas): 1630 mg/l 96.00 hours
Ecotoxicity	The product components are not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Environmental effects	Ecological injuries are not known or expected under normal use.
Persistence and degradability	Expected to be readily biodegradable.
Partition coefficient (n-octanol/water)	0.88

13. Disposal Considerations

Waste codes

US RCRA Hazardous Waste U List: Reference

n-BUTYL ALCOHOL (CAS 71-36-3) U031

Disposal instructions	Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. All wastes must be handled in accordance with local, state and federal regulations.
Contaminated packaging	Since emptied containers retain product residue, follow label warnings even after container is emptied. Residual vapors may explode on ignition; do not cut, drill, grind, or weld on or near this container. Offer rinsed packaging material to local recycling facilities.

14. Transport Information

DOT

Basic shipping requirements:

UN number	UN1120
Proper shipping name	Butanols
Hazard class	3
Packing group	III
Additional information:	
Special provisions	B1, IB3, T2, TP1
Basic shipping requirements:	
Labels required	3
Additional information:	
Packaging exceptions	150

Packaging non bulk 203
 Packaging bulk 242
 Reportable quantity 5000
 ERG number 129

IATA

Basic shipping requirements:

UN number 1120
 Proper shipping name Butanols
 Hazard class 3
 Packing group III
Additional information:
 ERG code 3L

IMDG

Basic shipping requirements:

UN number 1120
 Proper shipping name BUTANOLS
 Hazard class 3
 Packing group III



DOT



IATA



IMDG

15. Regulatory Information

US federal regulations

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
 All components are on the U.S. EPA TSCA Inventory List.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

n-BUTYL ALCOHOL (CAS 71-36-3) 1.0 %

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

n-BUTYL ALCOHOL (CAS 71-36-3) Listed.

CERCLA (Superfund) reportable quantity

n-BUTYL ALCOHOL: 5000.0000

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories
 Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - Yes
 Pressure Hazard - No
 Reactivity Hazard - No

Section 311 hazardous chemical
 Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

n-BUTYL ALCOHOL (CAS 71-36-3) 500 LBS

US - Pennsylvania RTK - Hazardous Substances: Listed substance

n-BUTYL ALCOHOL (CAS 71-36-3) Listed.

Saf-T-Data Health: 2 - Moderate (Life)
 Flammability: 2 - Moderate
 Reactivity: 1 - Slight
 Contact: 3 - Severe
 Lab Protective Equip: DB - GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
 Storage Color Code: R - Red (Flammable)

16. Labeling Info

Label Hazard Warning DANGER
 FLAMMABLE LIQUID AND VAPOR. May be ignited by heat, sparks or flames. Harmful if swallowed - may enter lungs if swallowed or vomited. Causes eye burns. Irritating to respiratory system and skin. High vapor concentrations may cause drowsiness and irritation of the eyes or respiratory tract. Prolonged exposure may cause chronic effects.

Label Precautions Keep away from heat, sparks and flame. Do not breathe mist or vapor. Do not get in eyes and avoid contact with skin and clothing. Do not taste or swallow. Use only with adequate ventilation. Wash thoroughly after handling. Keep container closed.

Label First Aid Immediately flush eyes with plenty of water for at least 15 minutes. Flush skin thoroughly with water. If gas/fume/vapor/dust/mist from the material is inhaled, remove the affected person immediately to fresh air. Get medical attention immediately. IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

17. Other Information

NFPA ratings Health: 2
 Flammability: 3
 Instability: 0

Disclaimer

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