



## Material Safety Data Sheet

Creation Date 21-Jan-2009

Revision Date 23-Sep-2009

Revision Number 1

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product Name** 1-Butanol

**Cat No.** A383-1; A383-4; A383SK-1; A383SK-4; A398-4; A399-1; A399-4; A399-20; A399-500; A399J-4; A399S-4; A400-4; BP505-25; BP505-500; BP2603-100

**Synonyms** n-Butanol; n-Butyl alcohol; n-Propyl carbinol (HPLC/Technical/Certified ACS/Spectranalyzed)

**Recommended Use** Laboratory chemicals

**Company** Fisher Scientific  
One Reagent Lane  
Fair Lawn, NJ 07410  
Tel: (201) 796-7100

**Emergency Telephone Number**  
CHEMTREC®, Inside the USA: 800-424-9300  
CHEMTREC®, Outside the USA: 703-527-3887

### 2. HAZARDS IDENTIFICATION

#### WARNING!

#### Emergency Overview

Flammable liquid and vapor. Harmful if swallowed. Risk of serious damage to eyes. Irritating to eyes, respiratory system and skin. Vapors may cause drowsiness and dizziness.

**Appearance** Colorless

**Physical State** Liquid

**odor** Alcohol-like

**Target Organs** Skin, Respiratory system, Eyes

#### Potential Health Effects

#### Acute Effects

#### Principle Routes of Exposure

**Eyes**

**Skin**

**Inhalation**

**Ingestion**

Risk of serious damage to eyes. Irritating to eyes.

Irritating to skin. May be harmful in contact with skin.

Irritating to respiratory system. May be harmful if inhaled.

Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea.

#### **Chronic Effects**

May cause adverse liver effects. Experiments have shown reproductive toxicity effects on laboratory animals.

See Section 11 for additional Toxicological information.

**Aggravated Medical Conditions** Central nervous system disorders. Preexisting eye disorders. Skin disorders.

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

#### Haz/Non-haz

Component	CAS-No	Weight %
n-Butyl alcohol	71-36-3	99

### 4. FIRST AID MEASURES

<b>Eye Contact</b>	Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.
<b>Skin Contact</b>	Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.
<b>Inhalation</b>	Move to fresh air. If breathing is difficult, give oxygen. Do not use mouth-to-mouth resuscitation if victim ingested or inhaled the substance; induce artificial respiration with a respiratory medical device. Obtain medical attention.
<b>Ingestion</b>	Do not induce vomiting. Call a physician or Poison Control Center immediately.
<b>Notes to Physician</b>	Treat symptomatically.

### 5. FIRE-FIGHTING MEASURES

<b>Flash Point</b>	35°C / 95°F
<b>Method</b>	No information available.
<b>Autoignition Temperature</b>	340°C / 644°F
<b>Explosion Limits</b>	
<b>Upper</b>	11.2 vol %
<b>Lower</b>	1.4 vol %
<b>Suitable Extinguishing Media</b>	Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Cool closed containers exposed to fire with water spray.
<b>Unsuitable Extinguishing Media</b>	No information available.
<b>Hazardous Combustion Products</b>	No information available.
<b>Sensitivity to mechanical impact</b>	No information available.
<b>Sensitivity to static discharge</b>	No information available.

#### Specific Hazards Arising from the Chemical

Flammable. Risk of ignition. Containers may explode when heated. Vapors may form explosive mixtures with air. Vapors may travel to source of ignition and flash back.

#### Protective Equipment and Precautions for Firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Thermal decomposition can lead to release of irritating gases and vapors.

**NFPA**                      **Health 2**                      **Flammability 3**                      **Instability 0**                      **Physical hazards N/A**

**6. ACCIDENTAL RELEASE MEASURES**

**Personal Precautions**                      Use personal protective equipment. Remove all sources of ignition. Take precautionary measures against static discharges.

**Environmental Precautions**                      Should not be released into the environment.

**Methods for Containment and Clean Up**                      Soak up with inert absorbent material. Keep in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment.

**7. HANDLING AND STORAGE**

**Handling**                      Wear personal protective equipment. Do not get in eyes, on skin, or on clothing. Do not breathe vapors or spray mist. Keep away from open flames, hot surfaces and sources of ignition. Use only non-sparking tools. Use explosion-proof equipment. Take precautionary measures against static discharges.

**Storage**                      Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition. Flammables area.

**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

**Engineering Measures**                      Ensure that eyewash stations and safety showers are close to the workstation location. Ensure adequate ventilation, especially in confined areas. Use explosion-proof electrical/ventilating/lighting/equipment.

**Exposure Guidelines**

Component	ACGIH TLV	OSHA PEL	NIOSH IDLH
n-Butyl alcohol	TWA: 20 ppm	Skin (Vacated) Ceiling: 50 ppm (Vacated) Ceiling: 150 mg/m <sup>3</sup> TWA: 100 ppm TWA: 300 mg/m <sup>3</sup>	IDLH: 1400 ppm Ceiling: 150 mg/m <sup>3</sup> Ceiling: 50 ppm

Component	Quebec	Mexico OEL (TWA)	Ontario TWAEV
n-Butyl alcohol	Ceiling: 50 ppm Ceiling: 152 mg/m <sup>3</sup> Skin	Peak: 150 mg/m <sup>3</sup> Peak: 50 ppm	TWA: 20 ppm

*NIOSH IDLH: Immediately Dangerous to Life or Health*

**Personal Protective Equipment**

**Eye/face Protection**

Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA's eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

**Skin and body protection**

Wear appropriate protective gloves and clothing to prevent skin exposure.

**Respiratory Protection**

Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH/MSHA or European Standard EN 149 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Physical State</b>	Liquid
<b>Appearance</b>	Colorless
<b>odor</b>	Alcohol-like
<b>Odor Threshold</b>	No information available.
<b>pH</b>	No information available.
<b>Vapor Pressure</b>	6.7 mbar @ 20 °C
<b>Vapor Density</b>	2.6 (Air = 1.0)
<b>Viscosity</b>	2.95 mPa.s (20 °C)
<b>Boiling Point/Range</b>	117.6°C / 243.7°F
<b>Melting Point/Range</b>	-89°C / -128.2°F
<b>Decomposition temperature °C</b>	No information available.
<b>Flash Point</b>	35°C / 95°F
<b>Evaporation Rate</b>	0.46 (Butyl Acetate = 1.0)
<b>Specific Gravity</b>	0.810
<b>Solubility</b>	Slightly soluble in water
<b>log Pow</b>	No data available
<b>Molecular Weight</b>	74.12
<b>Molecular Formula</b>	C4 H10 O

## 10. STABILITY AND REACTIVITY

<b>Stability</b>	Stable under normal conditions.
<b>Conditions to Avoid</b>	Incompatible products. Heat, flames and sparks.
<b>Incompatible Materials</b>	Strong oxidizing agents, Reducing agents, Acid chlorides, copper, Copper alloys, Acid anhydrides
<b>Hazardous Decomposition Products</b>	Carbon monoxide (CO), Carbon dioxide (CO <sub>2</sub> )
<b>Hazardous Polymerization</b>	Hazardous polymerization does not occur.
<b>Hazardous Reactions .</b>	None under normal processing..

## 11. TOXICOLOGICAL INFORMATION

### Acute Toxicity

#### Component Information

Component	LD50 Oral	LD50 Dermal	LC50 Inhalation
n-Butyl alcohol	790 mg/kg ( Rat )	3400 mg/kg ( Rabbit )	17.7 mg/L ( Rat ) 4 h 8000 ppm ( Rat ) 4 h

**Irritation** Severe eye irritant Irritating to respiratory system and skin

**Toxicologically Synergistic Products** No information available.

**Chronic Toxicity**

**Carcinogenicity** There are no known carcinogenic chemicals in this product

**Sensitization** No information available.

**Mutagenic Effects** Mutagenic effects have occurred in experimental animals.

**Reproductive Effects** Experiments have shown reproductive toxicity effects on laboratory animals.

**Developmental Effects** Developmental effects have occurred in experimental animals.

**Teratogenicity** Teratogenic effects have occurred in experimental animals..

**Other Adverse Effects** See actual entry in RTECS for complete information.

**Endocrine Disruptor Information** No information available

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

Component	Freshwater Algae	Freshwater Fish	Microtox	Water Flea
n-Butyl alcohol	EC50 96 h >500 mg/L EC50 72 h >500 mg/L EC50 96 h >500 mg/L	Not listed	EC50 = 2041.4 mg/L 5 min EC50 = 2186 mg/L 30 min EC50 = 3980 mg/L 24 h EC50 = 4400 mg/L 17 h	EC50 48 h 1983 mg/L

**Persistence and Degradability** No information available

**Bioaccumulation/ Accumulation** No information available

**Mobility**

Component	log Pow
n-Butyl alcohol	0.785

**13. DISPOSAL CONSIDERATIONS**

**Waste Disposal Methods** Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

Component	RCRA - U Series Wastes	RCRA - P Series Wastes
n-Butyl alcohol - 71-36-3	U031	-

**14. TRANSPORT INFORMATION**

**DOT**

**14. TRANSPORT INFORMATION**

**UN-No** UN1120  
**Proper Shipping Name** BUTANOLS  
**Hazard Class** 3  
**Packing Group** III

**TDG**

**UN-No** UN1120  
**Proper Shipping Name** BUTANOLS  
**Hazard Class** 3  
**Packing Group** III

**IATA**

**UN-No** UN1120  
**Proper Shipping Name** BUTANOLS  
**Hazard Class** 3  
**Packing Group** III

**IMDG/IMO**

**UN-No** UN1120  
**Proper Shipping Name** BUTANOLS  
**Hazard Class** 3  
**Packing Group** III

**15. REGULATORY INFORMATION**

**International Inventories**

Component	TSCA	DSL	NDSL	EINECS	ELINCS	NLP	PICCS	ENCS	AICS	CHINA	KECL
n-Butyl alcohol	X	X	-	200-751-6	-		X	X	X	X	KE-03867 X

**Legend:**

X - Listed

E - Indicates a substance that is the subject of a Section 5(e) Consent order under TSCA.

F - Indicates a substance that is the subject of a Section 5(f) Rule under TSCA.

N - Indicates a polymeric substance containing no free-radical initiator in its inventory name but is considered to cover the designated polymer made with any free-radical initiator regardless of the amount used.

P - Indicates a commenced PMN substance

R - Indicates a substance that is the subject of a Section 6 risk management rule under TSCA.

S - Indicates a substance that is identified in a proposed or final Significant New Use Rule

T - Indicates a substance that is the subject of a Section 4 test rule under TSCA.

XU - Indicates a substance exempt from reporting under the Inventory Update Rule, i.e. Partial Updating of the TSCA Inventory Data Base Production and Site Reports (40 CFR 710(B)).

Y1 - Indicates an exempt polymer that has a number-average molecular weight of 1,000 or greater.

Y2 - Indicates an exempt polymer that is a polyester and is made only from reactants included in a specified list of low concern reactants that comprises one of the eligibility criteria for the exemption rule.

**U.S. Federal Regulations**

**TSCA 12(b)** Not applicable

**SARA 313**

Component	CAS-No	Weight %	SARA 313 - Threshold Values %
n-Butyl alcohol	71-36-3	99	1.0

**SARA 311/312 Hazardous Categorization**

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	Yes
Sudden Release of Pressure Hazard	No
Reactive Hazard	No

**Clean Water Act**

Not applicable

**Clean Air Act**

Not applicable

**OSHA**

Not applicable

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Component	Hazardous Substances RQs	CERCLA EHS RQs
n-Butyl alcohol	5000 lb	-

**California Proposition 65**

This product does not contain any Proposition 65 chemicals.

**State Right-to-Know**

Component	Massachusetts	New Jersey	Pennsylvania	Illinois	Rhode Island
n-Butyl alcohol	X	X	X	-	X

**U.S. Department of Transportation**

Reportable Quantity (RQ):	Y
DOT Marine Pollutant	N
DOT Severe Marine Pollutant	N

**U.S. Department of Homeland Security**

This product does not contain any DHS chemicals.

**Other International Regulations**

**Mexico - Grade** Serious risk, Grade 3

**Canada**

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

**WHMIS Hazard Class**

B2 Flammable liquid

D2B Toxic materials

**16. OTHER INFORMATION**

**Prepared By** Regulatory Affairs  
Thermo Fisher Scientific  
Tel: (412) 490-8929

**Creation Date** 21-Jan-2009

**Print Date** 23-Sep-2009

**Revision Summary** "\*\*\*\*", and red text indicates revision

**Disclaimer**

The information provided on this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

**End of MSDS**