



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

SECTION 1: IDENTIFICATION

Product Name: GLYCOL ETHER DB

Chemical Family: Glycol Ethers

CAS Number: 112-34-5

Chemical Name: 2-(2-Butoxyethoxy) ethanol

Synonyms: diethylene glycol monobutyl ether; butoxyethoxy ethanol; butyl carbitol

Company

Silver Fern Chemical, Inc.
2226 Queen Anne Avenue North
Suite #C
Seattle WA 98109, USA

Business Contact

Customer Service: 206-282-3376
info@silverfernchemical.com

24 Hour Emergency Contact

Infotrac 800-535-5053
Outside USA & Canada 352-323-3500

SECTION 2: HAZARD IDENTIFICATION

Emergency Overview

This material is HAZARDOUS by OSHA Hazard Communication definition.

Signal Word

WARNING.

Hazards

May cause irritation to skin, eyes, and respiratory tract. May cause liver and/or kidney damage. Inhalation of vapors may cause central nervous system depression. May cause blood abnormalities.

HMIS (U.S.A.):

Health Hazard: 1
Fire Hazard: 1
Reactivity: 0
Personal Protection: E

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



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Health: 1

Flammability: 1

Reactivity: 0

Physical State

Liquid.

Color

Clear

Odor

Faint butyl odor

Odor Threshold

No value available.

Potential Health Effects

Routes of Exposure

Eye. Inhalation. Skin. Ingestion.

Signs and Symptoms of Acute Exposure

See component summary.

Diethylene glycol monobutyl ether 112-34-5

Moderate eye irritant. Effects of eye irritation are reversible. Contact may cause mild skin irritation. Not expected to be a sensitizer. Not a skin absorption hazard.

2-Butoxyethanol 111-76-2

May be irritating to the eyes, skin, and respiratory system. Exposure could cause central nervous system depression and liver and kidney damage. Severe over-exposure may cause red blood cell damage.

Skin

May cause slight irritation if left in contact with skin.

Inhalation

Vapors or mists from this material can irritate the nose, throat and lungs, and cause signs and symptoms of central nervous system (CNS) depression, depending on the concentration and duration of exposure.

Eye

Causes noticeable pain, severe irritation and transient corneal injury.



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Ingestion

May cause CNS depression, gastrointestinal tract, liver and kidney damage.

Chronic Health Effects

See component summary.

Diethylene glycol monobutyl ether 112-34-5

May cause dermatitis by defatting the skin from prolonged or repeated contact.

2-Butoxyethanol 111-76-2

May cause dermatitis by defatting the skin from prolonged or repeated contact. This substance may have effects on the haematopoietic system, resulting in blood disorders. Animal carcinogen.

Conditions Aggravated by Exposure

Any pre-existing disorders or diseases of the: central nervous system (CNS) skin eyes liver kidney and/or blood

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Component Name	CAS #	EU Inventory	Concentration Wt.%
Diethylene glycol monobutyl ether	112-34-5	203-961-6	98.0 - 99.5
2-Butoxyethanol	111-76-2	203-905-0	<= 1.0

Compositions given are typical values not specifications.

SECTION 4: FIRST AID MEASURES

General

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. For specific information refer to the Emergency Overview in Section 2 of this MSDS.

Skin

Immediately remove excess chemical and contaminated clothing; thoroughly wash contaminated skin with mild soap and water. If irritation persists after washing, seek medical attention. Thoroughly clean contaminated clothing before reuse; discard contaminated leather goods (gloves, shoes, belts, wallets, etc.).

Inhalation

If symptoms are experienced, move victim to fresh air. Seek medical attention if discomfort persists.



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Eye

Thoroughly flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If irritation persists, seek medical attention.

Ingestion

If product is ingested, do not induce vomiting and contact a physician or Poison Control Center.

SECTION 5: FIRE FIGHTING MEASURES

Flammable Properties

Classification

OSHA/NFPA Class IIIIB combustible liquid.

Flash Point

106 °C (222.8 °F) closed cup

Auto-Ignition Temperature

228 °C (442.4 °F)

Lower Flammable Limit

0.85 vol%

Upper Flammable Limit

24.6 vol%

Extinguishing Media

Suitable:

SMALL FIRE: Use dry chemicals, CO₂, water spray or alcohol-resistant foam LARGE FIRE: Use water spray, water fog or alcohol-resistant foam

Protection of Firefighters

Protective Equipment/Clothing:

Wear an approved positive pressure self-contained breathing apparatus and firefighter turnout gear.

Fire Fighting Guidance:



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Do not get water inside containers. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. Always stay away from tanks engulfed in fire.

Hazardous Combustion Products:

Carbon oxides (CO, CO₂)

SECTION 6: ACCIDENTAL RELEASE MEASURES

Release Response

Contain spill with dike to prevent entry into sewers or waterways. For large spills, dike and pump into properly labeled containers for reclamation or disposal. For small spills, soak up with absorbent material and place in properly labeled containers for disposal. All recovered material should be packaged, labeled, transported and disposed of or reclaimed in conformance with applicable laws and regulations and in conformance with good engineering practices. Reclaim where possible.

SECTION 7: HANDLING AND STORAGE

Handling

Do not handle near heat, sparks, or flame. Avoid contact with incompatible agents. Use only with adequate ventilation/personal protection. Avoid contact with eyes, skin and clothing. Do not enter storage area unless adequately ventilated. Metal containers involved in the transfer of this material should be grounded and bonded. It is recommended that any liquid product exposed to air not be highly concentrated by evaporation without first assuring that no peroxide is present. Alternately, positive steps should be taken to reduce any accumulated peroxides to a safe level before concentrating the liquid.

Storage

Store containers in a cool, dry, ventilated, fire resistant area away from sources of ignition and incompatible materials. Keep container tightly closed and properly labeled.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. Emergency shower and eyewash facility should be in close proximity (ANSI Z358.1)

Personal Protection

Inhalation

A respiratory protection program that meets OSHA's 29 CFR 1910.134 or ANSI Z88.2 requirements must be followed whenever workplace conditions warrant respirator use.



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Skin

Wear chemical resistant gloves such as: Rubber PVC

Eye

Wear safety glasses as minimum eye protection. Conditions may warrant the use of chemical goggles and possibly a face shield. Consult your standard operating procedure or safety professional for advice. Use protective eye and face devices that comply with ANSI Z87.1-1987.

Additional Remarks

Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and the hazards and/or potential hazards that may be encountered during use.

Occupational Exposure Limits:

<u>Component Name</u>	<u>Source</u>	<u>Type</u>	<u>Value</u>	<u>Notation</u>
2-Butoxyethanol	US (ACGIH)	TWA	20 ppm	None.
	US (OSHA)	TWA	50 ppm 240 mg/m ³	Skin.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Liquid. Clear

Odor: Faint butyl odor

Odor Threshold: No value available.

pH: 6 - 7.5

Boiling Point/Boiling Range: 230 °C (446 °F) @ 760 mm Hg

Freezing Point/Melting Point: -68 °C (-90.4 °F)

Flash Point: 106 °C (222.8 °F) closed cup

Auto-ignition: 228 °C (442.4 °F)

Flammability: OSHA/NFPA Class IIIB combustible liquid.

Lower Flammable Limit: 0.85 vol%



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Upper Flammable Limit: 24.6 vol%

Explosive Properties: No Data Available.

Oxidizing Properties: No Data Available.

Vapor Pressure: 0.06 mm Hg @ 20 °C (68 °F)

Evaporation Rate: 0.01 (butyl acetate = 1)

Relative Density: 0.95 @ 20 °C (68 °F)

Relative Vapor Density: 5.6 (Air = 1.0)

Viscosity: 6.5 mPa.s

Solubility (Water): Complete

Partition Coefficient (Kow): Log Kow = 0.5 Estimated

Additional Physical and Chemical Properties: No additional information available.

SECTION 10: STABILITY AND REACTIVITY

Chemical Stability

The product is stable.

Conditions to Avoid

Avoid contact with strong oxidizers, excessive heat, sparks or open flame.

Substances to Avoid

Oxidizers, Acids, Alkalis

Decomposition Products

Carbon Monoxide and Carbon dioxide.

Hazardous Polymerization

Will not occur.

Reactions with Air and Water

Does not react with water or common materials. May form peroxides in the presence of air.

SECTION 11: TOXICOLOGICAL INFORMATION

PRODUCT INFORMATION

Product Summary

See component summary.



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

COMPONENT INFORMATION

Diethylene glycol monobutyl ether 112-34-5

Acute Toxicity - Lethal Doses

LD50 (Oral) Rat 5080 MG/KG Mouse 2406 MG/KG

LD50 (Skin) Rabbit 2764 MG/KG

Irritation

Skin

This substance is a mild skin irritant.

Eye

Moderate eye irritant.

Target Organ Effects

Eye.

Reproductive Effects

In vivo animal studies show no adverse reproductive effects.

Developmental Effects

Results from animal studies demonstrate that this material is not a teratogen or toxic to the developing embryo or fetus.

Genetic Toxicity

Negative for genotoxicity both in vitro and in vivo tests.

Carcinogenicity

Not listed by IARC, NTP, OSHA or EPA.

2-Butoxyethanol 111-76-2

Acute Toxicity - Lethal Doses

LC50 (Inhl) Rat ~ 450 PPM 4 HOURS

LD50 (Oral) Rat 530 - 3000 MG/KG BWT Rabbit. 320 - 370 MG/KG BWT

LD50 (Skin) Rabbit. 612 MG/KG BWT

Acute Toxicity - Effects

Inhalation



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Exposure to vapor may cause irritation of the eyes, nose, and respiratory tract. May cause nausea. May cause headaches. Severe over-exposure or prolonged contact may cause red blood cell damage with weakness, confusion, anxiety, decreased blood pressure, and CNS depression with collapse and coma. Causes rapid damage to red blood cells and subsequent anemia. Repeated exposure may cause liver and kidney damage.

Ingestion

Ingestion may cause weakness, confusion, anxiety, decreased blood pressure, and CNS depression with collapse and coma. Causes rapid damage to red blood cells and subsequent anemia. Repeated exposure may cause liver and kidney damage.

Skin Contact

Moderate hazard by skin contact with liquid or vapor. May be absorbed through the skin and produce toxic effects such as CNS depression. High dermal doses (most likely achieved from exposure to undiluted liquid) may cause red blood cell damage with weakness, headache and nausea. Severe over-exposure or prolonged contact may cause red blood cell damage with weakness, confusion, anxiety, decreased blood pressure, and CNS depression with collapse and coma. Causes rapid damage to red blood cells and subsequent anemia. Repeated exposure may cause liver and kidney damage.

Irritation

Skin

Repeated or prolonged contact may cause skin irritation.

Eye

Moderate to severe eye irritant.

Sensitization

Not expected to cause sensitization by skin contact.

Target Organ Effects

Damages blood. Damages the lung. Damages the liver. Damages the kidney. Skin irritant. Eye irritant.

Repeated Dose Toxicity

Repeated exposure to EGBE at 125 ppm by inhalation caused injury to red blood cells with subsequent anemia and changes to the spleen, liver, and kidney. Inhalation exposure to EGBE at or above 32 ppm caused degeneration of the nasal epithelium. Repeated oral administration of EGBE at doses of 222 mg/kg bwt, caused injury to red blood cells with subsequent anemia and changes to the spleen, liver, and kidney. Repeated dermal exposure to EGBE at 180 mg/kg bwt caused injury to red blood cells. Moderate risk to health after prolonged exposure.

Reproductive Effects

No adverse effect on reproductive performance was observed in male and female mice exposed to EGBE in drinking water at a 700 mg/kg bwt/day over two generations. A slight reduction in pup body weights and decreased maternal water consumption was observed in mice exposed to 700 mg/kg bwt/day EGBE. Dose levels of 1300 mg/kg/day and higher caused significant parental toxicity (including mortality) and a decreased number of litters.



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Developmental Effects

EGBE is not teratogenic in rats or rabbits exposed by inhalation during organogenesis at concentrations up to 200 ppm. Maternal toxicity and minimal fetotoxicity occurred at or above 100 ppm. No maternal or developmental toxicity was observed in rabbits that received approximately 2100 mg/kg bwt/day EGBE by the dermal route of exposure during organogenesis.

Genetic Toxicity

No evidence of mutagenic activity in standard bacterial and mammalian test systems in vitro. No increase in micronuclei in rodents after in vivo exposure.

Carcinogenicity

Long-term exposure via inhalation at concentrations up to 125 ppm caused an increase in the incidence of liver tumors in male mice and forestomach tumors in female mice. A slight increase in adrenal tumors was observed in female rats. The NTP has determined that EGBE displays some evidence of carcinogenicity in mice, and equivocal evidence of carcinogenicity in female rats. The International Agency for Research on Cancer (IARC) has evaluated this material as an IARC Group 3 not classifiable as to carcinogenicity in humans, based on limited data in animals and inadequate data in humans.

SECTION 12: ECOLOGICAL INFORMATION

PRODUCT INFORMATION

Ecotoxicity

There is very limited information available on this material. This material, and structurally similar materials, have exhibited low toxicity in aquatic organisms. The odor and flavor of this material may attract some wildlife and cause them to consume spilled material.

Environmental Fate and Pathway

This material should biodegrade after an acclimation period, and it is not expected to be environmentally persistent. Due care should be taken to avoid accidental releases to aquatic or terrestrial systems.

Persistence and Degradability

Bioaccumulation: This material is highly soluble in water and should not bioaccumulate in aquatic or terrestrial organisms.

COMPONENT INFORMATION

Diethylene glycol monobutyl ether 112-34-5

Ecotoxicity



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

Acute toxicity to fish

LC50 / 96 HOUR silverside minnow. 2,000 mg/l

LC50 / 96 HOUR bluegill. 1,300 mg/l

Summary: This material is not harmful or toxic to fish.

Acute toxicity to aquatic invertebrates

Summary: No Data Available.

Toxicity to aquatic plants

Summary: No Data Available.

Environmental Fate and Pathway

Expected to have high mobility in soils. It is water soluble and is expected to have low volatility. This material is expected to exist solely as a vapor in the ambient atmosphere. Vapor-phase is degraded in the atmosphere by reaction with photochemically produced hydroxyl radicals. Hydrolysis is not expected to be an important factor in the environmental fate process for this material.

Persistence and Degradability

Stability in Soil: The Koc value suggests that this compound would be highly mobile if released onto soil and would not adsorb to suspended solids or sediments.

Biodegradation: This material is expected to be readily biodegradable.

Bioaccumulation: 2.0 BCF < 5 This material is not expected to bioaccumulate.

2-Butoxyethanol 111-76-2

Ecotoxicity

Acute toxicity to fish

LC50 / 96 HOURS bluegill. 1,490 mg/l

LC50 / 96 HOURS fathead minnow 2,137 mg/l

LC50 / 24 HOURS goldfish 1,650 mg/l

Summary: This material is not harmful or toxic to fish.

Acute toxicity to aquatic invertebrates

LC50 / 48 HOURS Brown shrimp 775 mg/l

LC50 / 48 HOURS waterflea. 835 mg/l

Summary: This material is not harmful or toxic to aquatic invertebrates.

Toxicity to aquatic plants

EC0 / 192 HOURS blue green algae. 35 mg/l



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

LOEC / 168 HOURS green algae. 900 mg/l
LOEC / 168 HOURS green algae (Selenastrum). 250 mg/l
Summary: This material is harmful to algae or higher aquatic plants.

Toxicity to microorganisms
EC0 / 16 HOURS bacteria. 700 mg/l
Summary: This material is not toxic or harmful to bacteria.

Chronic toxicity to fish
LC50 / 7 d guppy. 983 mg/l

Chronic toxicity to aquatic invertebrates
Summary: No Data Available.

Environmental Fate and Pathway

In air, the estimated photodegradation half-life of EGBE ranges from 16 to 27.5 hours. Does not undergo hydrolysis.

Mobility

Transport between environmental compartments: Highly mobile in soil and likely to volatilize from moist or dry soil surfaces. Expected to volatilize from surface waters and not likely to adsorb to suspended solids and sediment in water.

Persistence and Degradability

Stability in Water: In water, the volatilization half-life of EGBE from a model river and lake is estimated to be 25 days and 185 days, respectively. The estimated half-life in groundwater ranging from 14 days to 8 weeks.

Stability in Soil: In soil, the estimated half-life of EGBE ranges from 7 days to 4 weeks.

Biodegradation: This material is expected to be readily biodegradable.

Bioaccumulation: Low potential for bioaccumulation. BCF = 3.0 (estimated).

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of all waste and contaminated equipment in accordance with all applicable federal, state and local health and environmental regulations. Recovery and reuse, rather than disposal, should be the ultimate goal of handling efforts. The materials resulting from clean-up operations may be hazardous wastes and therefore, subject to specific regulations.



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

SECTION 14: TRANSPORT INFORMATION

Special Requirements

If you reformulate or further process this material, you should consider re-evaluation of the regulatory status of the components listed in the composition section of this sheet, based on final composition of your product.

Proper Shipping Name GLYCOL ETHERS, NOT ELSEWHERE CLASSIFIED, NOT REGULATED (DIETHYLENE GLYCOL MONOBUTYL ETHER)

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15: REGULATORY INFORMATION

Regulatory Status:

<u>Country</u>	<u>Inventory</u>
Australia	AICS
Canada	DSL
China	IECS
European Union	EINECS
Japan	ENCS
Korea	ECL
Philippines	PICCS
United States	TSCA

If identified components of this product are listed under the TSCA 12(b) Export Notification rule, they will be listed below.

SARA 302/304

This product contains no known chemicals regulated under SARA 302/304.

SARA 311/312

Based upon available information, this material is classified as the following health and/or physical hazards according to Section 311 & 312:

Immediate (Acute) Health Hazard.
Delayed (Chronic) Health Hazard.



SILVER FERN CHEMICAL

Material Safety Data Sheet

GLYCOL ETHER DB

SARA 313

This product contains no known chemicals regulated under SARA 313.

State Reporting

This product contains no known chemicals regulated by **California's** Proposition 65.

This product contains the following chemicals regulated by **New Jersey's** Worker and Community Right to Know Act:
2-Butoxyethanol 111-76-2

This product contains the following chemicals regulated by **Massachusetts'** Right to Know Law:
2-Butoxyethanol 111-76-2

This product contains the following chemicals regulated by **Pennsylvania's** Right to Know Act:
2-Butoxyethanol 111-76-2

SECTION 16: OTHER INFORMATION

Date Created: 2/29/2008

Date Last Updated: 2/29/2008

DISCLAIMER OF RESPONSIBILITY

The information on this MSDS was obtained from sources which we believe are reliable. However, the information is provided without any warranty, expressed or implied, regarding its correctness. Some information presented and conclusions drawn herein are from sources other than direct test data on the substance itself. The conditions or methods of handling, storage, use and disposal of the product are beyond our control and may be beyond our knowledge. For this and other reasons, we do not assume responsibility and expressly disclaim liability for loss, damage, or expense arising out of or in any way connected with handling, storage, use, or disposal of this product. If the product is used as a component in another product, this MSDS information may not be applicable.

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