

Material Safety Data Sheet

Ethyl Ether (Stabilized with 1.5-2.5 Ethanol)

ACC# 90867

Section 1 - Chemical Product and Company Identification

MSDS Name: Ethyl Ether (Stabilized with 1.5-2.5 Ethanol)**Catalog Numbers:** E197-1, E197-4, E1974U, E198-4, E198J4, E199-4, S73990-1, S73990-2, S73990SPEC**Synonyms:** Ethane, 1,1'-oxybis-; Anesthetic ether; Diethyl ether; Ethoxyethane; Diethyl oxide; Ethyl ether; Ether; Ethyl oxide.**Company Identification:**Fisher Scientific
1 Reagent Lane
Fair Lawn, NJ 07410**For information, call:** 201-796-7100**Emergency Number:** 201-796-7100**For CHEMTREC assistance, call:** 800-424-9300**For International CHEMTREC assistance, call:** 703-527-3887

Section 2 - Composition, Information on Ingredients

CAS#	Chemical Name	Percent	EINECS/ELINCS
60-29-7	Ethyl ether	>97.0	200-467-2
64-17-5	Ethyl alcohol	1.5-2.5	200-578-6

Hazard Symbols: XN F+**Risk Phrases:** 12 19 22 66 67

Section 3 - Hazards Identification

EMERGENCY OVERVIEW

Appearance: APHA: 10 max clear liquid. Flash Point: -45 deg C. **Danger!** Causes eye and skin irritation. May cause central nervous system depression. May form explosive peroxides. Hygroscopic (absorbs moisture from the air). Air sensitive. Light sensitive. Aspiration hazard if swallowed. Can enter lungs and cause damage. May be harmful if swallowed. May be habit forming. Extremely flammable liquid and vapor. Vapor may cause flash fire.

Target Organs: Central nervous system, respiratory system, eyes, skin.**Potential Health Effects****Eye:** Causes moderate eye irritation. Causes redness and pain.**Skin:** Causes skin irritation. May be absorbed through the skin. Repeated or prolonged exposure may cause drying and cracking of the skin.

Ingestion: Aspiration hazard. Symptoms may include: headache, excitement, fatigue, nausea, vomiting, stupor, and coma. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. Aspiration of material into the lungs may cause chemical pneumonitis, which may be fatal.

Inhalation: Exposure to high concentrations may produce narcosis, nausea and loss of consciousness. Inhalation of vapors may cause drowsiness and dizziness.

Chronic: Prolonged or repeated skin contact may cause defatting and dermatitis. Prolonged or repeated exposure can cause psychic abnormalities such as anxiety, depression and excitability. Laboratory experiments have resulted in mutagenic effects. Prolonged exposure to high vapor concentrations may cause eye injury. Repeated exposures may be habit forming. Prolonged or repeated inhalation or ingestion may result in liver and kidney changes.

Section 4 - First Aid Measures

Eyes: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical aid.

Skin: In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Get medical aid. Wash clothing before reuse.

Ingestion: Potential for aspiration if swallowed. Get medical aid immediately. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical aid.

Notes to Physician: Persons with kidney disease, chronic respiratory disease, liver disease, or skin disease may be at increased risk from exposure to this substance. Alcoholic beverage consumption may enhance the toxic effects of this substance. Treat symptomatically and supportively.

Section 5 - Fire Fighting Measures

General Information: As in any fire, wear a self-contained breathing apparatus in pressure-demand, MSHA/NIOSH (approved or equivalent), and full protective gear. Vapors may form an explosive mixture with air. Extremely flammable. Material will readily ignite at room temperature. Use water spray to keep fire-exposed containers cool. Water may be ineffective. Material is lighter than water and a fire may be spread by the use of water. Containers may explode in the heat of a fire. May form explosive peroxides. Will be easily ignited by heat, sparks or flame. May re-ignite after fire is extinguished. Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas. This liquid floats on water and may travel to a source of ignition and spread fire.

Extinguishing Media: For small fires, use dry chemical, carbon dioxide, water spray or alcohol-resistant foam. Water may be ineffective. For large fires, use water spray, fog or alcohol-resistant foam. Do NOT use straight streams of water. Cool containers with flooding quantities of water until well after fire is out.

Flash Point: -45 deg C (-49.00 deg F)

Autoignition Temperature: 160 deg C (320.00 deg F)

Explosion Limits, Lower: 1.9 vol %

Upper: 36.0 vol %

NFPA Rating: (estimated) Health: 1; Flammability: 4; Instability: 1

Section 6 - Accidental Release Measures

General Information: Use proper personal protective equipment as indicated in Section 8.

Spills/Leaks: Avoid runoff into storm sewers and ditches which lead to waterways. Remove all sources of ignition. Absorb spill using an absorbent, non-combustible material such as earth, sand, or vermiculite. Do not use combustible materials such as saw dust. Use a spark-proof tool. Place under an inert atmosphere. A vapor suppressing foam may be used to reduce vapors.

Section 7 - Handling and Storage

Handling: Wash thoroughly after handling. Remove contaminated clothing and wash before reuse. Ground and bond containers when transferring material. Avoid contact with eyes, skin, and clothing. Empty containers retain product residue, (liquid and/or vapor), and can be dangerous. Take precautionary measures against static discharges. Keep container tightly closed. Avoid contact with heat, sparks and flame. Handle under an inert atmosphere. If peroxide formation is suspected, do not open or move container. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Use only with adequate ventilation. Avoid breathing vapor.

Storage: Keep away from heat, sparks, and flame. Keep away from sources of ignition. Do not store near combustible materials. Do not store in direct sunlight. Store in a tightly closed container. Store in a cool, dry, well-ventilated area away from incompatible substances. Flammables-area. Do not expose to air. Store protected from light. Store under an inert atmosphere. Keep away from oxidizing agents. Store at room temperature or below. Do not exceed 86°F. Do not open unless contents are at 72°F or below for at least 24 hours. Ethyl ether may form explosive peroxides on long standing or after exposure to air or light.

Section 8 - Exposure Controls, Personal Protection

Engineering Controls: Use process enclosure, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.

Exposure Limits

Chemical Name	ACGIH	NIOSH	OSHA - Final PELs
Ethyl ether	400 ppm TWA; 500 ppm STEL	1900 ppm IDLH	400 ppm TWA; 1200 mg/m ³ TWA
Ethyl alcohol	1000 ppm TWA	1000 ppm TWA; 1900 mg/m ³ TWA 3300 ppm IDLH	1000 ppm TWA; 1900 mg/m ³ TWA

OSHA Vacated PELs: Ethyl ether: 400 ppm TWA; 1200 mg/m³ TWA Ethyl alcohol: 1000 ppm TWA; 1900 mg/m³ TWA

Personal Protective Equipment

Eyes: Wear chemical goggles.

Skin: Wear appropriate protective gloves to prevent skin exposure.

Clothing: Wear appropriate protective clothing to prevent skin exposure.

Respirators: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements or European Standard EN 149 must be followed whenever workplace conditions warrant a

respirator's use.

Section 9 - Physical and Chemical Properties

Physical State: Clear liquid
Appearance: APHA: 10 max
Odor: sweetish odor - aromatic odor
pH: Not available.
Vapor Pressure: 442 mm Hg @ 20C
Vapor Density: 2.55 (Air=1)
Evaporation Rate: 37.5 (Butyl acetate=1)
Viscosity: 0.2448 cp @ 20C
Boiling Point: 34.6 deg C
Freezing/Melting Point: -116.3 deg C
Decomposition Temperature: Not available.
Solubility: Slightly soluble.
Specific Gravity/Density: .708 - .710 g/ml
Molecular Formula: C₄H₁₀O
Molecular Weight: 74.12

Section 10 - Stability and Reactivity

Chemical Stability: Stable under normal temperatures and pressures. Prolonged exposure to air and sunlight may form unstable peroxides.
Conditions to Avoid: Light, ignition sources, exposure to air, electrical sparks, exposure to flame, heat.
Incompatibilities with Other Materials: Strong oxidizing agents, bromine trifluoride, chlorine trifluoride, halogens, nitric acid, permanganates, silver perchlorate, sodium peroxide, sulfur, sulfuric acid, hydrogen peroxides, ozone, bromine, chromyl chloride, fluorine nitrate, nitrosyl perchlorate, bromine pentafluoride, perchloric acid, chromic anhydride, interhalogens, chlorine, uranyl nitrate, moisture, air, iodine heptafluoride, boron triazide, wood pulp extracts + heat, acetyl peroxide, bromoazide, potassium peroxide, triethyl or trimethyl aluminum + air, lithium aluminum hydride, thiotriazolyl perchlorate, nitryl perchlorate, permanganic acid, peroxodisulfuric acid, iodine (VII) oxide, sulfonyl chloride, liquid air.
Hazardous Decomposition Products: Carbon monoxide, irritating and toxic fumes and gases, carbon dioxide, peroxides.
Hazardous Polymerization: Will not occur.

Section 11 - Toxicological Information

RTECS#:
CAS# 60-29-7: KI5775000
CAS# 64-17-5: KQ6300000
LD50/LC50:
CAS# 60-29-7:
 Draize test, rabbit, eye: 100 mg Moderate;
 Inhalation, mouse: LC50 = 31000 ppm/30M;

Oral, rat: LD50 = 1215 mg/kg;
 Skin, rabbit: LD50 = >20 mL/kg;
 CAS# 64-17-5:
 Draize test, rabbit, eye: 500 mg Severe;
 Draize test, rabbit, eye: 500 mg/24H Mild;
 Draize test, rabbit, skin: 20 mg/24H Moderate;
 Inhalation, mouse: LC50 = 39 gm/m³/4H;
 Inhalation, rat: LC50 = 20000 ppm/10H;
 Oral, mouse: LD50 = 3450 mg/kg;
 Oral, rabbit: LD50 = 6300 mg/kg;
 Oral, rat: LD50 = 9000 mg/kg;
 Oral, rat: LD50 = 7060 mg/kg;

Carcinogenicity:

CAS# 60-29-7: Not listed by ACGIH, IARC, NIOSH, NTP, or OSHA. CAS# 64-17-5:

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Epidemiology: No information available.

Teratogenicity: No information available.

Reproductive Effects: No information available.

Neurotoxicity: No information available.

Mutagenicity: DNA Repair: Escherichia coli = 35670 ug/well/16H.; DNA Inhibition: Mouse, Embryo = 2850 mg/L.; Mutation Test Systems - not otherwise specified: Hamster, Fibroblast = 1 pph.

Other Studies: Open Irritation Test: Administration onto the skin (rabbit) = 360 mg (Mild). Standard Draize Test: Administration into the eye (rabbit) = 100 mg (Moderate). Standard Draize Test : Administration onto the skin (rabbit) = 50 mg/24H (Severe). Standard Draize Test: Administration into the eye (human) = 100 ppm.

Section 12 - Ecological Information

Ecotoxicity: Fish: Fathead Minnow: LC50 = 2600 mg/L; 96 Hr; Flow-through bioassay Bluegill/Sunfish: LC50 >10000 mg/L; 96 Hr; Static bioassay via: Phytobacterium phosphoreum: EC50 = 5625 mg/L; 15 min; Microtox test If ethyl ether is released to soil, it will be subject to volatilization. It will be expected to exhibit high mobility in soil and, therefore, it may leach to groundwater. If ethyl ether is released to water, it will not be expected to significantly adsorb to sediment or suspended particulate matter, bioconcentrate in aquatic organisms or hydrolyze.

Environmental: Ethyl ether will not significantly photooxidize via reaction with photochemically produced hydroxyl radicals in the water. Ethyl ether in surface water will be subject to rapid volatilization with estimated half-lives of 3.1 hr and 1.5 days. It will not be expected to hydrolyze in water or soil. If ethyl ether is released to the atmosphere, it will be expected to exist almost entirely in the vapor phase. It will be susceptible to photooxidation via vapor phase reaction with photochemically produced hydroxyl radicals with a half-life of 29 hours.

Physical: No information available.

Other: No information available.

Section 13 - Disposal Considerations

Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. US EPA guidelines for the classification determination are listed in 40 CFR Parts 261.3. Additionally, waste generators must consult state and local hazardous waste regulations to ensure complete and accurate classification.

RCRA P-Series: None listed.

RCRA U-Series: CAS# 60-29-7: waste number U117 (Ignitable waste).

Section 14 - Transport Information

	US DOT	IATA	RID/ADR	IMO	Canada TDG
Shipping Name:	DIETHYL ETHER				No information available.
Hazard Class:	3				
UN Number:	UN1155				
Packing Group:	I				

Section 15 - Regulatory Information

US FEDERAL

TSCA

CAS# 60-29-7 is listed on the TSCA inventory.

CAS# 64-17-5 is listed on the TSCA inventory.

Health & Safety Reporting List

None of the chemicals are on the Health & Safety Reporting List.

Chemical Test Rules

None of the chemicals in this product are under a Chemical Test Rule.

Section 12b

None of the chemicals are listed under TSCA Section 12b.

TSCA Significant New Use Rule

None of the chemicals in this material have a SNUR under TSCA.

SARA

CERCLA Hazardous Substances and corresponding RQs

CAS# 60-29-7: 100 lb final RQ; 45.4 kg final RQ

SARA Section 302 Extremely Hazardous Substances

None of the chemicals in this product have a TPQ.

SARA Codes

CAS # 60-29-7: acute, flammable, sudden release of pressure, reactive. CAS # 64-17-5: acute, chronic, flammable.

Section 313

No chemicals are reportable under Section 313.

Clean Air Act:

This material does not contain any hazardous air pollutants. This material does not contain any Class 1 Ozone depleters. This material does not contain any Class 2 Ozone depleters.

Clean Water Act:

None of the chemicals in this product are listed as Hazardous Substances under the CWA. None of the chemicals in this product are listed as Priority Pollutants under the CWA. None of the chemicals in this product are listed as Toxic Pollutants under the CWA.

OSHA:

None of the chemicals in this product are considered highly hazardous by OSHA.

STATE

CAS# 60-29-7 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

CAS# 64-17-5 can be found on the following state right to know lists: California, New Jersey, Pennsylvania, Minnesota, Massachusetts.

WARNING: This product contains Ethyl alcohol, a chemical known to the state of California to cause birth defects or other reproductive harm. California No Significant Risk Level: None of the chemicals in this product are listed.

European/International Regulations

European Labeling in Accordance with EC Directives

Hazard Symbols:

XN F+

Risk Phrases:

R 12 Extremely flammable.

R 19 May form explosive peroxides.

R 22 Harmful if swallowed.

R 66 Repeated exposure may cause skin dryness or cracking.

R 67 Vapors may cause drowsiness and dizziness.

Safety Phrases:

S 16 Keep away from sources of ignition - No smoking.

S 29 Do not empty into drains.

S 33 Take precautionary measures against static discharges.

S 9 Keep container in a well-ventilated place.

WGK (Water Danger/Protection)

CAS# 60-29-7: 1

CAS# 64-17-5: 0

Canada - DSL/NDSL

CAS# 60-29-7 is listed on Canada's DSL List.

CAS# 64-17-5 is listed on Canada's DSL List.

Canada - WHMIS

This product has a WHMIS classification of B2, D2B.

Canadian Ingredient Disclosure List

CAS# 60-29-7 is listed on the Canadian Ingredient Disclosure List.

CAS# 64-17-5 is listed on the Canadian Ingredient Disclosure List.

Exposure Limits

CAS# 60-29-7: OEL-AUSTRALIA:TWA 400 ppm (1200 mg/m³);STEL 500 ppm (1500 mg/m³) OEL-AUSTRIA:TWA 400 ppm (1200 mg/m³) OEL-BELGIUM:TWA 400 ppm (1210 mg/m³);STEL 500 ppm (1520 mg/m³) OEL-CZECHOSLOVAKIA:TWA 500 mg/m³;STEL 1500 mg/m³ OEL-DENMARK:TWA 400 ppm (1200 mg/m³) OEL-FINLAND:TWA 400 ppm (1200 mg/m³);STEL 500 ppm (1500 mg/m³) OEL-FRANCE:TWA 400 ppm (1200 mg/m³);STEL 500 ppm (1500 mg/m³) OEL-GERMANY:TWA 400 ppm (1200 mg/m³) OEL-HUNGARY:TWA 300 mg/m³;STEL 600 mg/m³;Skin OEL-JAPAN:TWA 400 ppm (1200 mg/m³) OEL-THE NETHERLANDS:TWA 400 ppm (1200 mg/m³) JAN9 OEL-THE PHILIPPINES:TWA 400 ppm (1200 mg/m³) JAN9 OEL-POLAND:TWA 300 mg/m³ OEL-RUSSIA:TWA 400 ppm;STEL 300 mg/m³ OEL-SWEDEN:TWA 400 ppm (1200 mg/m³);STEL 500 ppm (1500 mg/m³) OEL-SWITZERLAND:TWA

400 ppm (1200 mg/m³);STEL 800 ppm OEL-TURKEY:TWA 400 ppm (1200 mg/m³)
OEL-UNITED KINGDOM:TWA 400 ppm (1200 mg/m³);STEL 500 ppm OEL IN BUL
GARIA, COLOMBIA, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SI
NGAPORE, VIETNAM check ACGI TLV
CAS# 64-17-5: OEL-AUSTRALIA:TWA 1000 ppm (1900 mg/m³) OEL-BELGIUM:T
WA 1000 ppm (1880 mg/m³) OEL-CZECHOSLOVAKIA:TWA 1000 mg/m³;STEL 5000
mg/m³ OEL-DENMARK:TWA 1000 ppm (1900 mg/m³) OEL-FINLAND:TWA 1000 ppm
(1900 mg/m³);STEL 1250 ppm (2400 mg/m³) OEL-FRANCE:TWA 1000 ppm (190
0 mg/m³);STEL 5000 pp OEL-GERMANY:TWA 1000 ppm (1900 mg/m³) OEL-HUNG
ARY:TWA 1000 mg/m³;STEL 3000 mg/m³ OEL-THE NETHERLANDS:TWA 1000 ppm (
1900 mg/m³) OEL-THE PHILIPPINES:TWA 1000 ppm (1900 mg/m³) OEL-POLAND
:TWA 1000 mg/m³ OEL-RUSSIA:STEL 1000 mg/m³ OEL-SWEDEN:TWA 1000 ppm (
1900 mg/m³) OEL-SWITZERLAND:TWA 1000 ppm (1900 mg/m³) OEL-THAILAND:T
WA 1000 ppm (1900 mg/m³) OEL-TURKEY:TWA 1000 ppm (1900 mg/m³) OEL-UN
ITED KINGDOM:TWA 1000 ppm (1900 mg/m³) JAN9 OEL IN BULGARIA, COLOMBIA
, JORDAN, KOREA check ACGIH TLV OEL IN NEW ZEALAND, SINGAPORE, VIETNA
M check ACGI TLV

Section 16 - Additional Information

MSDS Creation Date: 6/02/1999

Revision #5 Date: 3/18/2003

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall Fisher be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if Fisher has been advised of the possibility of such damages.