



ignition. No smoking. Do not empty into drains. Take precautionary measures against static discharges.

Storage Color Code: Red (flammable)  
Ether, Anhydrous

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SECTION 2 COMPONENTS  
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Components	CAS No.	Weight %	OSHA/PEL	ACGIH/TLV
Diethyl ether	60-29-7	97 - 100	400 ppm	400 ppm
Ethanol	64-17-5	< 2.5	1000 ppm	1000 ppm

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SECTION 3 PHYSICAL DATA  
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Boiling Point @ 760 mm Hg: 35°C (95°F)  
Vapor Pressure (mm Hg): 442 (20°C) Vapor Density (Air=1): 2.6  
Specific Gravity (H<sub>2</sub>O=1): 0.71 pH: NA  
Percent Volatiles by Volume: 100 (21°C)  
Evaporation Rate (Butyl Acetate=1): 37.5  
Melting Point @ 760 mm Hg: -116°C (-176°F)  
Solubility (H<sub>2</sub>O): Moderate (1 - 10%)  
Odor Threshold (ppm): NA Physical State: Liquid  
Coefficient Water/Oil Distribution: NA  
Appearance & Odor: Clear, colorless liquid. Characteristic odor.

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SECTION 4 FIRE & EXPLOSION INFORMATION  
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Flash Point (Closed Cup): -44°C (-49°F)  
Autoignition Temperature: 179°C (356°F)  
Flammable Limits: Upper - 36% Lower - 1.9%  
Extinguishing Media: Use alcohol foam, dry chemical or carbon dioxide. (Water may be ineffective.)  
Special Firefighting Procedures: Firefighters should wear proper protective equipment and self-contained breathing apparatus with a full facepiece operated in the positive pressure mode. Move containers from fire area if it can be done without risk. Use water to keep fire-exposed containers cool.  
Unusual Fire & Explosion Hazards: Vapors may flow along surfaces to distant ignition sources and flash back. Closed containers exposed to heat may explode. Contact with strong oxidizers may

cause fire. May form explosive peroxides, especially when heated. Forms shock-sensitive mixtures with certain other materials.

Ether, Anhydrous

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SECTION 4 FIRE & EXPLOSION INFORMATION Cont'd  
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Toxic Gases Produced: Carbon monoxide & Carbon dioxide

Explosion Data-Sensitivity to Mechanical Impact: None identified

Explosion Data-Sensitivity to Static Discharge: None identified  
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SECTION 5 HEALTH HAZARD DATA  
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Threshold Limit Value (TLV/TWA): 1200 mg/m<sup>3</sup> (400 ppm)

Short-Term Exposure Limit (STEL): 1500 mg/m<sup>3</sup> (500 ppm)

Permissible Exposure Limit (PEL): 1200 mg/m<sup>3</sup> (400 ppm)

Toxicity of Components:

Oral Rat LD50 for Diethyl ether 1215 mg/kg

Inhalation - 4 Hr. Rat LC50 Diethyl ether 32000 ppm

Oral Rat LD50 for Ethanol 7060 mg/kg

Inhalation - 10 Hr. Rat LC50 Ethanol 20000 ppm

Carcinogenicity: NTP: No IARC: No Z List: No OSHA Reg: No

Carcinogenicity: None identified.

Reproductive Effects: None identified.

Effects of Overexposure:

Inhalation: Central nervous system depression, headache, nausea, vomiting, drowsiness, irritation of upper respiratory tract, jaundice, liver damage, unconsciousness.

Skin Contact: Irritation, prolonged contact may cause skin sensitization.

Eye Contact: Irritation

Skin Absorption: Rapid absorption, central nervous system depression, headache, nausea, vomiting, drowsiness, jaundice, liver damage.

Ingestion: Central nervous system depression, headache, nausea, vomiting, drowsiness, nervousness, jaundice, liver damage, heart failure, respiratory failure, unconsciousness.

Chronic Effects: Central nervous system depression

Target Organs: Central nervous system, eyes, skin, mucous membranes, respiratory system, lungs, heart, liver.

Ether, Anhydrous

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SECTION 5 HEALTH HAZARD DATA Cont'd  
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Medical Conditions Generally Aggravated by Exposure: None identified.

Primary Routes of Entry: Inhalation, ingestion, eye contact, skin contact, absorption.

Emergency & First Aid Procedures

Ingestion: Call a physician. If swallowed, do NOT induce vomiting. If conscious, give large amounts of water.

Inhalation: If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Prompt action is essential.

Skin Contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before re-use.

Eye Contact: In case of eye contact, immediately flush with plenty of water for at least 15 minutes.

Sara Title III Hazard Categories & Lists

Acute: Yes Chronic: Yes Flammability: Yes

Pressure: No Reactivity: No

Extremely Hazardous Substance: No

CERCLA Hazardous Substance: Yes contains Ethane, 1,1'-oxybis-  
(RQ=100 lbs.)

Sara 313 Toxic Chemicals: No

TSCA Inventory: Yes

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SECTION 6 REACTIVITY DATA  
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Hazardous Polymerization: Will not occur.

Stability: Stable

Conditions to Avoid: Heat, flame, other sources of ignition,  
light, air.

Incompatibles: Strong bases, strong oxidizing agents.

Decomposition Products: Explosive peroxides, carbon monoxide,  
carbon dioxide

Ether, Anhydrous

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SECTION 7 SPILL & DISPOSAL PROCEDURES  
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Steps to be Taken in the Event of a Spill or Discharge: Wear  
self-contained breathing apparatus and full protective clothing.  
Shut off ignition sources; no flares, smoking or flames in area.  
Stop leak if you can do so without risk. Use water spray to  
reduce vapors. Take up with sand or other non-combustible  
absorbent material and place into container for later disposal.  
Flush area with water.

Disposal Procedure: Dispose in accordance with all applicable  
federal, state, and local environmental regulations.

EPA Hazardous Waste Number: U117 (Toxic Waste)

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SECTION 8 INDUSTRIAL PROTECTIVE EQUIPMENT  
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Ventilation: Use general or local exhaust ventilation to meet  
TLV requirements.

Respiratory Protection: Respiratory protection required if  
airborne concentration exceeds TLV. At concentrations up to 1000  
ppm, a chemical cartridge respirator with organic vapor cartridge  
is recommended. Above this level, a self-contained breathing  
apparatus is recommended.

Eye/Skin Protection: Safety goggles, uniform, apron, nitrile gloves are recommended.

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SECTION 9 STORAGE & HANDLING PRECAUTIONS  
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Storage Requirements: Keep container tightly closed. Store in a cool, dry, well-ventilated, flammable liquid storage area. Isolate from incompatible materials.

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SECTION 9 STORAGE & HANDLING PRECAUTIONS Cont'd  
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Special Precautions: Bond and ground containers when transfer ring liquid. Ether is subject to peroxide formation in opened containers and should be protected from exposure to air as much as possible. When low peroxide ether is required, use only material from an unopened can. Do not allow to evaporate to near dryness. Addition of water or appropriate reducing agents will lessen peroxide formation. Discard any remaining ether in opened containers that is not consumed after 2-3 days. Use caution when opening cap. Important - Do not use after expiration date.

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SECTION 10 TRANSPORTATION DATA & ADDITIONAL INFORMATION  
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Domestic (D.O.T.)

Proper Shipping Name: Diethyl ether Hazard Class: 3  
Labels: 3 Flammable Liquid UN/NA: UN1155  
Regulatory References: 49CFR172.101 Packaging Group: I

International (I.M.O.)

Proper Shipping Name: Diethyl ether Hazard Class: 3.1  
Labels: 3 Flammable Liquid UN/NA: UN1155  
Regulatory References: 49CFR Part 176 Packaging Group: I  
IMDG Code  
Marine Pollutants: No I.M.O. Page: 3117

Air (I.C.A.O.)

Proper Shipping Name: Diethyl ether Hazard Class: 3  
Labels: 3 Flammable Liquid UN/NA: UN1155  
Regulatory References: 49CFR Part 175 Packaging Group: I

U.S. Customs Harmonization Number: 29091100005

Note: When handling liquid products, secondary protective containers must be used for carrying.

NA = Not applicable or not available.

NE = Not established