SAFETY DATA SHEET: ETHYL ETHER

1. IDENTIFICATION

Product Name: ETHYL ETHER
Synonyms: Diethyl Ether; Ether; Ethyl oxide; Diethyl oxide
Formula and Formula Weight: C2H5OC2H5  74.12
Integra numbers beginning with: E740.10
Recommended Use: Industrial uses
Restrictions on Use: No information available

INTEGRA Chemical Company
24 Hour Emergency Response: CHEMTREC 800-424-9300 (Outside USA 703-527-3887)
1216 6th Ave N
Kent WA 98032
Phone: 253-479-7000

2. HAZARDS IDENTIFICATION

OSHA Classification:
Acute Toxicity - Oral 4 Harmful if swallowed.
Eye Damage/Irritation 2A Causes serious eye irritation.
Specific Target Organ Toxicity (single exposure) 3 May cause drowsiness or dizziness.
Flammable Liquids 1 Extremely flammable liquid and vapor.

Signal Word: Danger

Precautionary Statements
Prevention:
Keep away from heat, sparks, open flames, hot surfaces. – No smoking.
Keep container tightly closed.
Ground, bond container and receiving equipment.
Use explosion-proof electrical, ventilating, lighting, equipment.
Use only non-sparking tools and take precautionary measures against static discharge.
Avoid breathing fume, gas, mist, vapors, spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves, eye protection, face protection.

Response
If swallowed: Rinse mouth. Call a poison center, doctor if you feel unwell.
If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water, shower.
If inhaled: Remove person to fresh air and keep comfortable for breathing.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice, attention.

Storage
Store in a well ventilated place. Keep cool. Keep container tightly closed.
Store locked up.

Disposal
Dispose of contents, container in accordance with all governmental regulations.

Hazards Not Otherwise Classified: No information available

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>Synonyms</th>
<th>CAS #</th>
<th>% Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethyl Ether</td>
<td>Diethyl ether; Ether; Ethyl oxide; Diethyl oxide</td>
<td>00060-29-7</td>
<td>100</td>
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</tbody>
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4. FIRST AID MEASURES

Inhalation: Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult administer oxygen. Seek medical attention.

Eye Contact: Flush eyes with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Seek medical attention.

Skin Contact: Remove contaminated clothing. Flush skin with plenty of water. Seek medical attention if irritation develops.

Ingestion: Rinse mouth and give victim large quantities of water. Never give anything by mouth to an unconscious person. Seek immediate medical attention.
5. FIRE-FIGHTING MEASURES

Extinguishing Media: Carbon dioxide, dry chemical or alcohol foam. Water may be ineffective. Treat as a flammable gas in a fire situation.

Special Equipment and Precautions: Use water to cool nearby containers and structures. Wear full protective equipment, including suitable respiratory protection. Water usage should be in flooding quantities.

Specific Hazards: Vapors may flow along surfaces to distant ignition sources and flash back. Vapors are heavier than air and will settle in low areas. Material may float on water and re-ignite. Material may form explosive peroxides on long standing or on exposure to air or light. Sensitive to static discharge.


6. ACCIDENTAL RELEASE MEASURES

Spill Procedures: Remove all potential ignition sources. Prevent spread of spill. Wear full protective equipment including suitable respiratory protection. Absorb with sand or inert material. Place into suitable container for disposal.

7. HANDLING AND STORAGE

Incompatible Materials: Incompatible with strong acids and strong oxidizers. Sulfur, sulfur compounds, acetyl peroxide, liquid air, bromoazide, chlorine.

Storage and Handling: Store locked up in a cool, dry, well-ventilated flammable liquids storage area or cabinet away from incompatible materials. Keep away from heat and ignition sources. Keep containers tightly closed and protect them from physical damage. Bond and ground containers when transferring liquid. Use only non-sparking tools and take precautionary measures against static discharge. No smoking. Test for peroxide content before heating, especially after prolonged storage.

Keep away from heat, sparks, open flames, hot surfaces. -- No smoking.

Keep container tightly closed.

Ground, bond container and receiving equipment.

Use explosion-proof electrical, ventilating, lighting, equipment.

Use only non-sparking tools and take precautionary measures against static discharge.

Avoid breathing fume, gas, mist, vapors, spray.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Use only outdoors or in a well-ventilated area.

Wear protective gloves, eye protection, face protection.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

OSHA & ACGIH Exposure Limits:

Ethyl Ether: OSHA TWA: 400 ppm; 1200 mg/m3 ACGIH TWA: 400 ppm; 1210 mg/m3 ACGIH STEL: 500 ppm; 1520 mg/m3

Engineering Controls: Use general or local exhaust ventilation to meet TLV and PEL requirements. Ventilation system must be explosion proof.

Respiratory Protection: Respiratory protection required if airborne concentrations exceed PEL or TLV. Use a NIOSH approved chemical cartridge respirator with an organic vapor cartridge. A full face piece respirator or SCBA should be on hand for emergency situations.

Skin/Eye Protective Equipment: Safety goggles, face shield, chemical-resistant gloves and protective clothing appropriate for the risk of exposure.

Facilities storing or utilizing this material should have readily accessible eyewash stations and safety showers. Select respirators and other safety equipment in accordance with regulations and based upon the particular conditions of use and risk of exposure. Always use safe chemical-handling and good industrial hygiene practices.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Clear, colorless liquid.

Odor: Pungent, sweet odor.

Odor Threshold: 8.9 ppm

pH: Not available

Melting/Freezing Point: -116 °C

Initial Boiling Point and Boiling Range: 35 °C

Flash Point: -45 °C

Evaporation Rate: 37.5 Butyl Acetate=1

Flammability: Flammable

Flammable or Explosive Limits (% by volume in air) Upper: 48 Lower: 1.7

Vapor Pressure: 440 mm Hg@20°C

Vapor Density: 2.6

Relative Density: 0.7 Water=1

Solubility: 7g/100g water @20°C

Partition Coefficient: n-octanol/water 0.89
10. STABILITY AND REACTIVITY

Reactivity: No information available
Stability: Unstable
Possibility of Hazardous Reactions: Hazardous polymerization will not occur
Conditions to Avoid: Heat, sparks and open flame. Heat, light, exposure to air and long standing all contribute to instability and the formation of peroxides. Peroxides can be detonated by friction, impact, or heating.
Incompatibles: Incompatible with strong acids and strong oxidizers. Sulfur, sulfur compounds, acetyl peroxide, liquid air, bromoazide, chlorine.

11. TOXICOLOGICAL INFORMATION

Effects of Over Exposure:
Inhalation: Harmful or fatal if inhaled. General anesthesia by inhalation can occur. Continued exposure may lead to respiratory failure or death. Symptoms include irritation of nose and throat, vomiting, and irregular respiration, followed by dizziness, drowsiness and unconsciousness.
Skin Contact: May cause skin irritation. Prolonged contact may cause dermatitis. Harmful if absorbed through skin.
Eye Contact: May irritate or burn the eyes.
Ingestion: Harmful if swallowed. Ingestion may cause headache, dizziness, nausea, vomiting, gastrointestinal irritation. May be fatal if swallowed.
Chronic Effects: Repeated exposures may be habit forming. Prolonged exposures may result in headache, drowsiness, excitation, and psychic disturbances.
Target Organs: Central nervous system, liver, kidneys, skin. Respiratory system, eyes.
Additional Effects: May aggravate pre-existing respiratory, skin, liver and kidney conditions. Alcoholic beverage consumption can enhance the toxic effects of this substance.
Reproductive Effects: None identified
Carcinogenicity: None identified

Toxicity Data:
- Ethyl Ether
  - LDlo (oral, human): 260 mg/kg
  - Irritation (skin, rabbit): Mild, 360 mg
  - Irritation (eye, rabbit): Moderate, 100 mg
  - LC50 (inhalation, mouse): 31000 ppm/30 min
  - LD50 (oral, rat): 1215 mg/kg

12. ECOLOGICAL INFORMATION

Aquatic Toxicity Data:
- Ethyl Ether
  - LC50 Pimephales promelas: 2560 mg/L

Terrestrial Toxicity Data:
- No information available

Persistence and degradability: No information available
Bioaccumulative potential: No information available
Mobility in soil: No information available
Other adverse effects: No information available

13. DISPOSAL CONSIDERATIONS

Disposal Procedures: Dispose of material and containers in accordance with all local, state and federal regulations.

14. TRANSPORTATION INFORMATION

This product is a regulated material for domestic ground transporation, per CFR Title 49.

UN Number: UN1155
Proper Shipping Name: Ethyl ether
Packing Group: I
Hazard Class: 3
Environmental hazards: No information available
Special precautions: No information available
Bulk transport: No information available

15. REGULATORY INFORMATION

Ethyl Ether is listed in the TSCA inventory.

16. OTHER INFORMATION

OSHA SDS #: 25594 rev 101 3.27.2015

NE = Not established, NA = Not applicable or Not available
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***** END OF SDS *****