MATERIAL SAFETY DATA SHEET
ETHYL ETHER

1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MSDS Name: Ethyl Ether
Synonyms: Diethyl Ether; Ether
Company Identification: Sisco Research Laboratories Pvt. Ltd.
Andheri (East), Mumbai – 400 099.
Tel : +91 22 2687 2601
Fax : +91 22 2687 8241
Website : www.srlchem.com

2 - COMPOSITION, INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS#</th>
<th>Chemical Name</th>
<th>%</th>
<th>EINECS#</th>
</tr>
</thead>
<tbody>
<tr>
<td>60-29-7</td>
<td>Diethyl ether</td>
<td>99.5%</td>
<td>200-467-2</td>
</tr>
</tbody>
</table>

3 - HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW
Extremely flammable. May form explosive peroxides. Harmful if swallowed. Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness. Hygroscopic (absorbs moisture from the air). Air sensitive. Light sensitive.

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:
Harmful if swallowed. 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.

4 - FIRST AID MEASURES

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

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

Ingestion: Get medical aid. 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. If vomiting occurs naturally, have victim lean forward.

Inhalation: Remove from exposure and move to fresh air immediately. 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.

6 - ACCIDENTAL RELEASE MEASURES

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

**Spills/Leaks:** Absorb spill with inert material (e.g. vermiculite, sand or earth), then place in suitable container. Avoid runoff into storm sewers and ditches which lead to waterways. Remove all sources of ignition. Use a spark-proof tool. Place under an inert atmosphere. A vapor suppressing foam may be used to reduce vapors.

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. Keep away from 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. Containers should be dated when opened and tested periodically for the presence of peroxides. Should crystals form in a peroxidizable liquid, peroxidation may have occurred and the product should be considered extremely dangerous. In this instance, the container should only be opened remotely by professionals. 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. All peroxidizable
substances should be stored away from heat and light and be protected from ignition sources.

### 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

**Engineering Controls:** Use explosion-proof ventilation equipment. Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower. Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.

**Exposure Limits**

CAS# 60-29-7:
- United Kingdom, WEL - TWA: 100 ppm TWA; 310 mg/m³ TWA
- United Kingdom, WEL - STEL: 200 ppm STEL; 620 mg/m³ STEL
- United States OSHA: 400 ppm TWA; 1200 mg/m³ TWA
- Belgium - TWA: 100 ppm VLE; 308 mg/m³ VLE Belgium - STEL: 200 ppm VLE; 616 mg/m³ VLE
- France - VME: 100 ppm VME; 308 mg/m³ VME France - VLE: 200 ppm VLE; 616 mg/m³ VLE
- Germany: 400 ppm TWA; 1200 mg/m³ TWA
- Japan: 400 ppm OEL; 1200 mg/m³ OEL
- Malaysia: 400 ppm TWA; 1210 mg/m³ TWA
- Netherlands: 200 ppm STEL; 616 mg/m³ STEL
- Netherlands: 100 ppm MAC; 308 mg/m³ MAC
- Russia: 300 mg/m³ TWA (vapour)
- Spain: 100 ppm VLA-ED; 308 mg/m³ VLA-ED Spain: 200 ppm VLA-EC; 616 mg/m³ VLA-EC

**Personal Protective Equipment**

- **Eyes:** Wear chemical splash goggles.
- **Skin:** Wear appropriate protective gloves to prevent skin exposure.
- **Clothing:** Wear appropriate protective clothing to prevent skin exposure.
- **Respirators:** 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

- **Physical State:** Clear liquid
- **Boiling Point:** 34.6 deg C @760mmHg (94.28°F)
- **Specific Gravity/Density:** 0.714
- **Molecular Formula:** C₄H₁₀O
- **Molecular Weight:** 74.12
10 - STABILITY AND REACTIVITY

Chemical Stability: Air sensitive. Sensitive to light. Hygroscopic: absorbs moisture or water from the air. Under normal storage conditions, peroxidizable compounds can form and accumulate peroxides which may explode when subjected to heat or shock. This material is most hazardous when peroxide levels are concentrated by distillation or evaporation.

Conditions to Avoid: Incompatible materials, light, ignition sources, exposure to air, electrical sparks, exposure to flame, heat.

Incompatibilities with Other Materials

Hazardous Decomposition Products Carbon monoxide, carbon dioxide, peroxides.

Hazardous Polymerization Will not occur.

11 - TOXICOLOGICAL INFORMATION

RTECS#: CAS# 60-29-7: KI5775000
LD50/LC50:
CAS# 60-29-7: Draize test, rabbit, eye: 100 mg Moderate; Inhalation, mouse: LC50 = 31000 ppm/30M; Oral, mouse: LD50 = 1760 mg/kg; Oral, rat: LD50 = 1215 mg/kg; Skin, rabbit: LD50 = >20 mL/kg;

Carcinogenicity: Diethyl ether - Not listed as a carcinogen by ACGIH, IARC, NTP, or CA Prop 65.

Other: See actual entry in RTECS for complete information

12 - ECOLOGICAL INFORMATION

Ecotoxicity: Fish: Fathead Minnow: LC50 = 14 mg/l; 96 Hr; Flow-through bioassay
Fish: Bluegill/Sunfish: LC50 = 14 mg/l; 96 Hr; Static bioassay
Bacteria: Phytobacterium phosphoreum: LC50 = 14 mg/l; 15 min; Microtox

13 - DISPOSAL CONSIDERATIONS

Dispose of in a manner consistent with federal, state, and local regulations.

14 - TRANSPORT INFORMATION

<table>
<thead>
<tr>
<th>IATA</th>
<th>IMO</th>
<th>RID/ADR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shipping Name: Diethyl Ether</td>
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</tr>
<tr>
<td>Hazard Class: 3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>UN Number: 1155</td>
<td>1155</td>
<td>1155</td>
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<tr>
<td>Packing Group: I</td>
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<td>I</td>
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</tbody>
</table>
### 15 - REGULATORY INFORMATION

**European/International Regulations**

**European Labeling in Accordance with EC Directives**

<table>
<thead>
<tr>
<th>Hazard Symbols:</th>
<th>XN F+</th>
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<td>Risk Phrases:</td>
<td>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 Vapours may cause drowsiness and dizziness.</td>
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<tr>
<td>Safety Phrases:</td>
<td>S 9 Keep container in a well-ventilated place. 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.</td>
</tr>
</tbody>
</table>

**WGK (Water Danger/Protection)**

- **CAS# 60-29-7**: 1
- **Canada**: CAS# 60-29-7 is listed on Canada's DSL List
- **US Federal**: 
  - **TSCA**: CAS# 60-29-7 is listed on the TSCA Inventory.

### 16 - ADDITIONAL INFORMATION

**SISCO RESEARCH LABORATORIES** provides the information contained herein in good faith but makes no representation as to its comprehensiveness or accuracy. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose.

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