# Material Safety Data Sheet

**Printing date 03/23/2010**  
**Reviewed on 03/22/2010**

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### 1 Identification of substance:

**Product details:**

**Product name:** Diethyl ether  
**Stock number:** 33224

**Manufacturer/Supplier:**  
Alfa Aesar, A Johnson Matthey Company  
Johnson Matthey Catalog Company, Inc.  
30 Bond Street  
Ward Hill, MA 01835-8099  
Emergency Phone: (978) 521-6300  
CHEMTREC: (800) 424-9300  
Web Site: [www.alfa.com](http://www.alfa.com)

**Information Department:** Health, Safety and Environmental Department  
**Emergency information:**  
During normal hours the Health, Safety and Environmental Department. After normal hours call CHEMTREC at (800) 424-9300.

### 2 Composition/Data on components:

**Chemical characterization:**

**Description:** (CAS#)  
Diethyl ether (CAS# 60-29-7)

**Identification number(s):**

**EINECS Number:** 200-467-2  
**Index number:** 603-022-00-4

### 3 Hazards identification

**Hazard description:**

- Xn Harmful
- F+ Extremely flammable

**Information pertaining to particular dangers for man and environment**

- **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 or dizziness

**Classification system**

**HMIS ratings (scale 0-4)**

- HEALTH 1  
  Health (acute effects) = 1
- FIRE 4  
  Flammability = 4
- REACTIVITY 1  
  Reactivity = 1

**GHS label elements**

**Danger**

2.6/1 - Extremely flammable liquid and vapour.

**Warning**

3.1/4 - Harmful if swallowed.
3.8/3 - May cause drowsiness or dizziness.

**Prevention:**

- Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
- Avoid release to the environment.
- Take precautionary measures against static discharge.

**Storage:**

- Store in a well-ventilated place.

### 4 First aid measures

**After inhalation**

Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Product name: Diethyl ether

Seek immediate medical advice.

After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing Seek immediate medical advice.

5 Fire fighting measures

Suitable extinguishing agents CO2, sand, extinguishing powder. Do not use water.

For safety reasons unsuitable extinguishing agents Water

Special hazards caused by the material, its products of combustion or resulting gases:

In case of fire, the following can be released:
Carbon monoxide and carbon dioxide

Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Person-related safety precautions: Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation Keep away from ignition sources

Measures for environmental protection: Do not allow material to be released to the environment without proper governmental permits.

Measures for cleaning/collection:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Ensure adequate ventilation.
Keep away from ignition sources.

Additional information: See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

Handling
Information for safe handling: Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Keep away from heat and direct sunlight.
Ensure good ventilation at the workplace.
Open and handle container with care.
Information about protection against explosions and fires: Keep ignition sources away.
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.
Do not distill to dryness.
Explosive peroxides may form, handle container cautiously.

Storage
Requirements to be met by storerooms and receptacles: Store in a cool location.
Information about storage in one common storage facility: Store away from oxidizing agents.
Further information about storage conditions:
Store in cool, dry conditions in well sealed containers.
Protect from heat and direct sunlight.
Avoid contact with air/oxygen (formation of peroxide).
Check container pressure periodically to prevent explosive peroxides.

8 Exposure controls and personal protection

Additional information about design of technical systems: Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Components with limit values that require monitoring at the workplace:
Diethyl ether ppm
ACGIH TLV 400; 500-STEL
9 Physical and chemical properties:

General Information

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Ether-like</td>
</tr>
<tr>
<td>Melting point/Melting range</td>
<td>-116°C (-177°F)</td>
</tr>
<tr>
<td>Boiling point/Boiling range</td>
<td>34.6°C (94°F)</td>
</tr>
<tr>
<td>Sublimation temperature / start</td>
<td>Not determined</td>
</tr>
<tr>
<td>Flash point</td>
<td>-45°C (-49°F)</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>180°C (356°F)</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>Not determined</td>
</tr>
<tr>
<td>Danger of explosion</td>
<td>May form explosive peroxides. Do not distill to dryness.</td>
</tr>
<tr>
<td>Explosion limits</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>1.7 Vol %</td>
</tr>
<tr>
<td>Upper</td>
<td>36 Vol %</td>
</tr>
<tr>
<td>Vapor pressure at 20°C (68°F)</td>
<td>587 hPa (440 mm Hg)</td>
</tr>
<tr>
<td>Density at 20°C (68°F)</td>
<td>0.7134 g/cm³</td>
</tr>
<tr>
<td>Solubility in / Miscibility with Water at 20°C (68°F)</td>
<td>69 g/l</td>
</tr>
<tr>
<td>Viscosity</td>
<td></td>
</tr>
<tr>
<td>dynamic at 20°C (68°F)</td>
<td>0.23 mPas</td>
</tr>
</tbody>
</table>

10 Stability and reactivity

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.

Materials to be avoided:
Oxidizing agents
Halogens
Interhalogens
11 Toxicological information

Acute toxicity:

| LD/LOC50 values that are relevant for classification: |
|-----------|-----------------|-----------------|
| Oral      | LD50 1015 mg/kg (rat) |
|           | LDLo 260 mg/kg (man)  |
| Dermal    | LD50 >20 mL/kg (rabbit) |
| Inhalative| LCLo/30M 31000 ppm/30M (mouse) |
| Irritation of skin | mild 360 mg (rabbit) |
|           | severe 50 mg/24H (guinea pig) |

Primary irritant effect:
- on the skin: Generally the product does not irritate the skin.
- on the eye: Causes mild irritant effect.

Sensitization: No sensitizing effects known.

Subacute to chronic toxicity:
Diethyl ether is a depressant of the central nervous system and is capable of causing intoxication, drowsiness, stupor and unconsciousness. Severe exposure may cause respiratory failure and death. On contact it may irritate the eyes.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

12 Ecological information:

Additional ecological information:

General notes:
- Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- Do not allow material to be released to the environment without proper governmental permits.

13 Disposal considerations

Product:
Recommendation Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

DOT regulations:

Hazard class: 3
Identification number: UN1155
Packing group: I
Proper shipping name (technical name): DIETHYL ETHER (ETHYL ETHER)
Label 3

Land transport ADR/RID (cross-border)

ADR/RID class: 3 (FI) Flammable liquids
Danger code (Kemler): 33
Product name: Diethyl ether

| UN-Number: | 1155 |
| Packaging group: | I |
| Description of goods: | 1155 DIETHYL ETHER (ETHYL ETHER) |

### Maritime transport IMDG:

- IMDG Class: 3
- UN Number: 1155
- Label: 3
- Packaging group: I
- Marine pollutant: No
- Proper shipping name: DIETHYL ETHER (ETHYL ETHER)

### Air transport ICAO-TI and IATA-DGR:

- ICAO/IATA Class: 3
- UN/ID Number: 1155
- Label: 3
- Packaging group: I
- Proper shipping name: DIETHYL ETHER (ETHYL ETHER)

**UN "Model Regulation":** UN1155, DIETHYL ETHER (ETHYL ETHER), 3, I

### 15 Regulations

**Product related hazard informations:**

- **Hazard symbols:**
  - Xn Harmful
  - F+ Extremely flammable

- **Risk phrases:**
  - 12 Extremely flammable.
  - 19 May form explosive peroxides.
  - 22 Harmful if swallowed.
  - 66 Repeated exposure may cause skin dryness or cracking
  - 67 Vapours may cause drowsiness and dizziness

- **Safety phrases:**
  - 9 Keep container in a well-ventilated place.
  - 16 Keep away from sources of ignition - No smoking.
  - 29 Do not empty into drains.
  - 33 Take precautionary measures against static discharges.

- **National regulations**
  All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.

- **Information about limitation of use:** For use only by technically qualified individuals.

### 16 Other information:

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

- Department issuing MSDS: Health, Safety and Environmental Department.
- Contact: Zachariah Holt

**Abbreviations and acronyms:**

- ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
- RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
- IMDG: International Maritime Code for Dangerous Goods
- DOT: US Department of Transportation
- IATA: International Air Transport Association
**Product name: Diethyl ether**

- **IATA-DGR**: Dangerous Goods Regulations by the "International Air Transport Association" (IATA)
- **ICAO**: International Civil Aviation Organization
- **ICAO-TI**: Technical Instructions by the "International Civil Aviation Organization" (ICAO)
- **GHS**: Globally Harmonized System of Classification and Labelling of Chemicals
- **EINECS**: European Inventory of Existing Commercial Chemical Substances
- **CAS**: Chemical Abstracts Service (division of the American Chemical Society)
- **HMIS**: Hazardous Materials Identification System (USA)
- **LC50**: Lethal concentration, 50 percent
- **LD50**: Lethal dose, 50 percent