SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product form</td>
<td>Substance</td>
</tr>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Substance name</td>
<td>ETHYL VINYL ETHER</td>
</tr>
<tr>
<td>Product code</td>
<td>ENEE1060</td>
</tr>
<tr>
<td>Formula</td>
<td>C4H8O</td>
</tr>
<tr>
<td>Synonyms</td>
<td>ETHOXYETHENE; VINYL ETHYL ETHER</td>
</tr>
<tr>
<td>Chemical family</td>
<td>ETHER</td>
</tr>
</tbody>
</table>

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture: Chemical intermediate
For research and industrial use only

1.3. Details of the supplier of the safety data sheet

GELEST, INC.
11 East Steel Road
Morrisville, PA 19067
USA
T 215-547-1015 - F 215-547-2484 - (M-F): 8:00 AM - 5:30 PM EST
info@gelest.com - www.gelest.com

1.4. Emergency telephone number

Emergency number: CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

GHS-US classification
Flam. Liq. 1 H224
Eye Irrit. 2A H319
Full text of H statements: see section 16

2.2. Label elements

GHS-US labeling
Hazard pictograms (GHS-US): 

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GHS02</td>
<td>Danger</td>
</tr>
<tr>
<td>GHS07</td>
<td></td>
</tr>
</tbody>
</table>

Signal word (GHS-US): Danger

Hazard statements (GHS-US): H224 - Extremely flammable liquid and vapor
H319 - Causes serious eye irritation

Precautionary statements (GHS-US):
P280 - Wear protective gloves/protective clothing/eye protection/face protection
P210 - Keep away from heat, open flames, sparks. - No smoking
P233 - Keep container tightly closed
P240 - Ground/Bond container and receiving equipment
P241 - Use explosion-proof electrical equipment
P242 - Use only non-sparking tools
P243 - Take precautionary measures against static discharge
P264 - Wash hands thoroughly after handling
P303+P361+P353 - If on skin (or hair): take off immediately all contaminated clothing. rinse skin with water/shower
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
P337+P313 - If eye irritation persists: Get medical advice/attention
P370+P378 - In case of fire: Use water spray or fog, foam, carbon dioxide, dry chemical to extinguish
P403+P235 - Keep in a cool place
P501 - Dispose of contents/container to licensed waste disposal facility

2.3. Other hazards

No additional information available
2.4. Unknown acute toxicity (GHS US)
No data available

SECTION 3: Composition/Information on ingredients

3.1. Substance
Substance type : Mono-constituent
Name : ETHYL VINYL ETHER
CAS No : 109-92-2
EC no : 203-718-4

<table>
<thead>
<tr>
<th>Name</th>
<th>Product identifier</th>
<th>%</th>
<th>GHS-US classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinyl ethyl ether</td>
<td>(CAS No) 109-92-2</td>
<td>98 - 100</td>
<td>Flam. Liq. 1, H224</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Irrit. 2A, H319</td>
</tr>
<tr>
<td>Potassium hydroxide</td>
<td>(CAS No) 1310-58-3</td>
<td>&lt; 0.1</td>
<td>Acute Tox. 3 (Oral), H301</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Skin Corr. 1A, H314</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Eye Dam. 1, H318</td>
</tr>
</tbody>
</table>

3.2. Mixture
Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures
First-aid measures general : Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.

First-aid measures after inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If you feel unwell, seek medical advice.

First-aid measures after skin contact : Wash with plenty of soap and water. Get medical advice/attention.

First-aid measures after eye contact : Remove contact lenses, if present and easy to do. Continue rinsing. Immediately flush eyes thoroughly with water for at least 15 minutes. Get medical advice/attention.

First-aid measures after ingestion : Never give anything by mouth to an unconscious person. Get medical advice/attention.

4.2. Most important symptoms and effects, both acute and delayed
Symptoms/injuries after inhalation : May cause irritation to the respiratory tract. May be harmful if inhaled.
Symptoms/injuries after skin contact : May cause mild skin irritation.
Symptoms/injuries after eye contact : Causes serious eye irritation.
Symptoms/injuries after ingestion : May be harmful if swallowed.

4.3. Indication of any immediate medical attention and special treatment needed
No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media
Unsuitable extinguishing media : Do not use straight streams.

5.2. Special hazards arising from the substance or mixture
Fire hazard : Extremely flammable liquid and vapor. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.
Explosion hazard : May form flammable/explosive vapor-air mixture.

5.3. Advice for firefighters
Firefighting instructions : Exercise caution when fighting any chemical fire. Use water spray or fog for cooling exposed containers.
Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapor and mist.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
General measures : Eliminate every possible source of ignition. Use special care to avoid static electric charges.

6.1.1. For non-emergency personnel
Protective equipment : Wear protective equipment as described in Section 8.
Emergency procedures : Evacuate unnecessary personnel.
ETHYL VINYL ETHER
Safety Data Sheet

6.1.2. For emergency responders
Protective equipment: Do not attempt to take action without suitable protective equipment. Equip cleanup crew with proper protection. For further information refer to section 8. "Exposure controls/personal protection".

6.2. Environmental precautions
Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up
For containment: Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.
Methods for cleaning up: Clean up any spills as soon as possible, using an absorbent material to collect it. Sweep or shovel spills into appropriate container for disposal. Use only non-sparking tools.

6.4. Reference to other sections
See Heading 8. Exposure controls and personal protection.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Additional hazards when processed: Handle empty containers with care because residual vapors are flammable. Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Precautions for safe handling: Avoid all eye and skin contact and do not breathe vapor and mist. Ground/bond container and receiving equipment. Provide good ventilation in process area to prevent accumulation of vapors. Take precautionary measures against static discharge. Use only non-sparking tools.
Hygiene measures: Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

7.2. Conditions for safe storage, including any incompatibilities
Technical measures: Proper grounding procedures to avoid static electricity should be followed. Use explosion-proof electrical equipment.
Storage conditions: Keep container tightly closed. Keep in a cool place. Store in sealed containers below 20°C.
Storage area: Store in a well-ventilated place. Store away from heat.

7.3. Specific end use(s)
No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Potassium hydroxide (1310-58-3)</th>
<th>USA ACGIH</th>
<th>ACGIH Ceiling (mg/m³)</th>
<th>2 mg/m³</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA NIOSH</td>
<td>NIOSH REL (ceiling) (mg/m³)</td>
<td>2 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

8.2. Exposure controls
Appropriate engineering controls: Provide local exhaust or general room ventilation.
Personal protective equipment: Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
Hand protection: Neoprene or nitrile rubber gloves.
Eye protection: Chemical goggles. Contact lenses should not be worn.
Skin and body protection: Wear suitable protective clothing.
Respiratory protection: Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified organic vapor (black cartridge) respirator.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties
Physical state: Liquid
Appearance: Clear liquid.
Molecular mass: 72.11 g/mol
Color: No data available
Odor: Acrid.
Odor threshold: No data available
Refractive index: 1.376
pH: No data available
Relative evaporation rate (butyl acetate=1): > 1
ETHYL VINYL ETHER
Safety Data Sheet

Melting point: No data available
Freezing point: -11 °C
Boiling point: 33 °C
Flash point: -46 °C
Auto-ignition temperature: 180 °C
Decomposition temperature: No data available
Flammability (solid, gas): Extremely flammable liquid and vapor
Vapor pressure: 425 mm Hg @ 20°C
Relative vapor density at 20 °C: > 1
Relative density: 0.753
VOC content: 100 %
Solubility: Water: 8.3 g/l
Log Pow: No data available
Log Kow: No data available
Viscosity, kinematic: 0.3 cSt
Viscosity, dynamic: No data available
Explosive properties: No data available
Oxidizing properties: No data available
Explosion limits: 1.35 - 12 vol % (lower; upper)

9.2. Other information
No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity
No additional information available

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
No additional information available

10.4. Conditions to avoid
Heat. Open flame. Sparks.

10.5. Incompatible materials
Oxidizing agent. Peroxides.

10.6. Hazardous decomposition products
Organic acid vapors.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity: Not classified

Vinyl ethyl ether (109-92-2)

LD50 oral rat: 8160 µl/kg ; 6150 mg/kg RTECS Number:KO0710000
LD50 dermal rabbit: > 20 ml/kg
LC50 inhalation rat (mg/l): > 21.2 mg/l/4h

Potassium hydroxide (1310-58-3)

LD50 oral rat: 284 mg/kg
ATE US (oral): 284.000 mg/kg body weight

Skin corrosion/irritation: Not classified
Skin Irritation - rabbit: 500 mg open: mild irritant effect

Serious eye damage/irritation: Causes serious eye irritation.
Respiratory or skin sensitization: Not classified
Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
None of the components in this product at concentrations >0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen

Reproductive toxicity: Not classified
Specific target organ toxicity (single exposure): Not classified
### Specific target organ toxicity (repeated exposure)

- Not classified

### Aspiration hazard

- Not classified

### Symptoms/injuries after inhalation

- May cause irritation to the respiratory tract. May be harmful if inhaled.

### Symptoms/injuries after skin contact

- May cause mild skin irritation.

### Symptoms/injuries after eye contact

- Causes serious eye irritation.

### Symptoms/injuries after ingestion

- May be harmful if swallowed.

### Reason for classification

- Expert judgment

### SECTION 12: Ecological information

#### 12.1. Toxicity

No additional information available

#### 12.2. Persistence and degradability

No additional information available

#### 12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Substance</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vinyl ethyl ether (109-92-2)</td>
<td>1.63 (at 25 °C)</td>
</tr>
<tr>
<td>Potassium hydroxide (1310-58-3)</td>
<td>0.65</td>
</tr>
</tbody>
</table>

#### 12.4. Mobility in soil

No additional information available

#### 12.5. Other adverse effects

- This substance may be hazardous to the environment.

#### Effect on ozone layer

- No additional information available

#### Effect on the global warming

- No known effects from this product.

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

- Do not dispose of waste into sewer.
- Incinerate. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility.
- Handle empty containers with care because residual vapors are flammable.
- Avoid release to the environment.

### SECTION 14: Transport information

#### 14.1. UN number

- UN-No.(DOT): 1302
- DOT NA no.: UN1302

#### 14.2. UN proper shipping name

- Proper Shipping Name (DOT): Vinyl ethyl ether, stabilized
- Class (DOT): 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
- Hazard labels (DOT): 3 - Flammable liquid

#### Packing group (DOT)

- I - Great Danger

#### DOT Packaging Exceptions (49 CFR 173.xxx)

- None

#### DOT Packaging Non Bulk (49 CFR 173.xxx)

- 201

#### DOT Packaging Bulk (49 CFR 173.xxx)

- 243

#### 14.3. Additional information

- Emergency Response Guide (ERG) Number: 127P
- Other information: No supplementary information available.
Transport by sea
DOT Vessel Stowage Location : D - The material must be stowed “on deck only” on a cargo vessel and on a passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers or one passenger per each 3 m of overall vessel length, but the material is prohibited on passenger vessels in which the limiting number of passengers is exceeded

Air transport
DOT Quantity Limitations Passenger aircraft/rail : 1 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 30 L

SECTION 15: Regulatory information

15.1. US Federal regulations

Vinyl ethyl ether (109-92-2)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Potassium hydroxide (1310-58-3)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. International regulations

Vinyl ethyl ether (109-92-2)
Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on the Canadian DSL (Domestic Substances List)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)

Potassium hydroxide (1310-58-3)
Listed on the AICS (Australian Inventory of Chemical Substances)
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Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on CICR (Turkish Inventory and Control of Chemicals)

15.3. US State regulations

<table>
<thead>
<tr>
<th>ETHYL VINYL ETHER (109-92-2)</th>
<th>California - Proposition 65 - Carcinogens List</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>California - Proposition 65 - Developmental</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Toxicity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>California - Proposition 65 - Reproductive</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Toxicity - Female</td>
<td></td>
</tr>
<tr>
<td></td>
<td>California - Proposition 65 - Reproductive</td>
<td>No</td>
</tr>
<tr>
<td></td>
<td>Toxicity - Male</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vinyl ethyl ether (109-92-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - California - Proposition 65 - Carcinogens List</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Developmental Toxicity</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</td>
</tr>
<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potassium hydroxide (1310-58-3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>U.S. - California - Proposition 65 - Carcinogens List</td>
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<tr>
<td>U.S. - California - Proposition 65 - Developmental Toxicity</td>
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<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Female</td>
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<tr>
<td>U.S. - California - Proposition 65 - Reproductive Toxicity - Male</td>
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</table>
## Potassium hydroxide (1310-58-3)

<table>
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<th></th>
<th>No</th>
<th>No</th>
<th>No</th>
<th>No</th>
</tr>
</thead>
</table>

## Vinyl ethyl ether (109-92-2)

- U.S. - Massachusetts - Right To Know List
- U.S. - New Jersey - Right to Know Hazardous Substance List
- U.S. - Pennsylvania - RTK (Right to Know) List

## Potassium hydroxide (1310-58-3)

- U.S. - Massachusetts - Right To Know List
- U.S. - New Jersey - Right to Know Hazardous Substance List
- U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
- U.S. - Pennsylvania - RTK (Right to Know) List

### SECTION 16: Other information

**Abbreviations and acronyms**
- Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development.

**Full text of H-phrases:**

<table>
<thead>
<tr>
<th>H224</th>
<th>Extremely flammable liquid and vapor</th>
</tr>
</thead>
<tbody>
<tr>
<td>H301</td>
<td>Toxic if swallowed</td>
</tr>
<tr>
<td>H314</td>
<td>Causes severe skin burns and eye damage</td>
</tr>
<tr>
<td>H318</td>
<td>Causes serious eye damage</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
</tbody>
</table>

**HMIS III Rating**

<table>
<thead>
<tr>
<th>Health</th>
<th>2 Moderate Hazard - Temporary or minor injury may occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flammability</td>
<td>4 Severe Hazard</td>
</tr>
<tr>
<td>Physical</td>
<td>1 Slight Hazard</td>
</tr>
</tbody>
</table>

Prepared by safety and environmental affairs.

**Date of issue:** 06/10/2016  
**Version:** 1.0

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SDS US (GHS HazCom 2012) - Custom

According to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

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