1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Ashland  
P.O. Box 2219  
Columbus, OH 43216  
Regulatory Information Number  
1-800-325-3751  
Telephone  
614-790-3333  
Emergency telephone  
1-800-ASHLAND (1-800-274-5263)

Product name  
ETHYLENE GLYCOL

Product code  
EG002

Product Use Description  
No data

2. HAZARDS IDENTIFICATION

Emergency Overview

Appearance: liquid, colourless

WARNING! MAY AFFECT THE CENTRAL NERVOUS SYSTEM CAUSING DIZZINESS, HEADACHE OR NAUSEA. MAY CAUSE EYE IRRITATION. HARMFUL IF SWALLOWED.

Potential Health Effects

Exposure routes
Inhalation, Skin absorption, Skin contact, Eye Contact, Ingestion

Eye contact
Can cause eye irritation. Symptoms include stinging, tearing, redness, and swelling of eyes.

Skin contact
May cause mild skin irritation. Symptoms may include redness and burning of skin. Skin absorption of this material (or a component) may be increased through injured skin.

Ingestion
Swallowing this material may be harmful. Liver, kidney and brain damage in humans has resulted from swallowing lethal or near-lethal amounts of ethylene glycol.

Inhalation
ETHYLENE GLYCOL  
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It is possible to breathe this material under certain conditions of handling and use (for example, during heating, spraying, or stirring). Breathing small amounts of this material during normal handling is not likely to cause harmful effects. Breathing large amounts may be harmful. Symptoms are not expected at air concentrations below the recommended exposure limits, if applicable (see Section 8.).

**Aggravated Medical Condition**

Exposure to this material may aggravate any preexisting condition sensitive to a decrease in available oxygen, such as chronic lung disease, coronary artery disease or anemias. Preexisting disorders of the following organs (or organ systems) may be aggravated by exposure to this material: lung (for example, asthma-like conditions), Liver, Kidney, Central nervous system

**Symptoms**

Signs and symptoms of exposure to this material through breathing, swallowing, and/or passage of the material through the skin may include: stomach or intestinal upset (nausea, vomiting, diarrhea), irritation (nose, throat, airways), Cough, central nervous system excitation (giddiness, liveliness, light-headed feeling) followed by central nervous system depression (dizziness, drowsiness, weakness, fatigue, nausea, headache, unconsciousness) and other central nervous system effects, involuntary eye movement, pain in the abdomen and lower back, cyanosis (causes blue coloring of the skin and nails from lack of oxygen), lung edema (fluid buildup in the lung tissue), acute kidney failure (sudden slowing or stopping of urine production), liver damage, Convulsions, coma

**Target Organs**

Overexposure to this material (or its components) has been suggested as a cause of the following effects in laboratory animals: reproductive effects, kidney damage, liver damage, central nervous system damage, Overexposure to this material (or its components) has been suggested as a cause of the following effects in humans: liver damage, kidney damage

**Carcinogenicity**

This material is not listed as a carcinogen by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or the Occupational Safety and Health Administration (OSHA).

**Reproductive hazard**

Ethylene glycol has caused birth defects in animal studies at high oral doses. However, it did not cause harm to the pregnant animal or to the fetus when applied to the skin of the pregnant animal. This material (or a component) has been shown to cause harm to the fetus in laboratory animal studies. Harm to the fetus occurs only at exposure levels that harm the pregnant animal. The relevance of these findings to humans is uncertain.
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Hazardous Components</th>
<th>CAS-No.</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>ETHYLENE GLYCOL</td>
<td>107-21-1</td>
<td>&lt;=100%</td>
</tr>
<tr>
<td>DIETHYLENE GLYCOL</td>
<td>111-46-6</td>
<td>&gt;=1.5-&lt;5%</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

**Eyes**
If symptoms develop, immediately move individual away from exposure and into fresh air. Flush eyes gently with water for at least 15 minutes while holding eyelids apart; seek immediate medical attention.

**Skin**
Remove contaminated clothing. Wash exposed area with soap and water. If symptoms persist, seek medical attention. Launder clothing before reuse.

**Ingestion**
Seek medical attention. If individual is drowsy or unconscious, do not give anything by mouth; place individual on the left side with the head down. Contact a physician, medical facility, or poison control center for advice about whether to induce vomiting. If possible, do not leave individual unattended.

**Inhalation**
If symptoms develop, move individual away from exposure and into fresh air. If symptoms persist, seek medical attention. If breathing is difficult, administer oxygen. Keep person warm and quiet; seek immediate medical attention.

**Notes to physician**
**Hazards:** Effects of acute ethylene glycol poisoning appear in three fairly distinct stages. The initial stage occurs shortly after exposure, lasts 6-12 hours, and is characterized by central nervous system effects (transient exhilaration, nausea, vomiting, and in severe cases, coma, convulsions, and possible death). The second stage lasts from 12-36 hours after exposure and is initiated by the onset of coma. This phase is characterized by tachypnea, tachycardia, mild hypotension, cyanosis, and in severe cases, pulmonary edema, bronchopneumonia, cardiac enlargement, and congestive failure. The final stage occurs 24-72 post-exposure and is characterized by renal failure, ranging from a mild increase in blood urea nitrogen and creatinine followed by recovery, to complete anuria with acute tubular necrosis that can lead to death. Oxaluria is found in most cases. The most significant laboratory finding in
ethylene glycol intoxication is severe metabolic acidosis. Ingestion or other significant exposure to this material (or a component) may cause metabolic acidosis.

**Treatment:** This product contains ethylene glycol. Ethanol decreases the metabolism of ethylene glycol to toxic metabolites. Ethanol should be administered as soon as possible in cases of severe poisoning since the elimination half-life of ethylene glycol is 3 hours. If medical care will be delayed several hours, give the patient three to four 1-ounce oral "shots" of 86-proof or higher whiskey before or during transport to the hospital. Fomepizole (4-methylpyrazole) is an effective antagonist of alcohol dehydrogenase, and as such, may be used as an antidote in the treatment of ethylene glycol poisoning. Hemodialysis effectively removes ethylene glycol and its metabolites from the body.

### 5. FIRE-FIGHTING MEASURES

**Suitable extinguishing media**  
Dry chemical, Carbon dioxide (CO2), Water spray

**Hazardous combustion products**  
Alcohols, Aldehydes, carbon dioxide and carbon monoxide, ethers, toxic fumes, Hydrocarbons

**Precautions for fire-fighting**  
Wear full firefighting turn-out gear (full Bunker gear), and respiratory protection (SCBA). DO NOT direct a solid stream of water or foam into hot, burning pools of liquid since this may cause frothing and increase fire intensity. Frothing can be violent and possibly endanger any firefighter standing too close to the burning liquid. Use water spray to cool fire exposed containers and structures until fire is out if it can be done with minimal risk. Avoid spreading burning material with water used for cooling purposes.

**NFPA Flammable and Combustible Liquids Classification**  
Combustible Liquid Class III B

### 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions**  
For personal protection see section 8. Persons not wearing protective equipment should be excluded from area of spill until clean-up has been completed.

**Environmental precautions**  
Prevent spreading over a wide area (e.g. by containment or oil barriers). Do not let product enter drains. Do not flush into surface water or sanitary sewer system.
Methods for cleaning up
   Keep in suitable, closed containers for disposal. Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

Other information
   Comply with all applicable federal, state, and local regulations.

7. HANDLING AND STORAGE

Handling
   Containers of this material may be hazardous when emptied. Since emptied containers retain product residues (vapor, liquid, and/or solid), all hazard precautions given in the data sheet must be observed.

Storage
   Store in a cool, dry, ventilated area.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Guidelines

<table>
<thead>
<tr>
<th>ETHYLENE GLYCOL</th>
<th>107-21-1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACGIH Ceiling Limit Value:</td>
<td>100 mg/m³</td>
</tr>
</tbody>
</table>

General advice
   These recommendations provide general guidance for handling this product. Personal protective equipment should be selected for individual applications and should consider factors which affect exposure potential, such as handling practices, chemical concentrations and ventilation. It is ultimately the responsibility of the employer to follow regulatory guidelines established by local authorities.

Exposure controls
   Provide sufficient mechanical (general and/or local exhaust) ventilation to maintain exposure below exposure guidelines (if applicable) or below levels that cause known, suspected or apparent adverse effects.

Eye protection
   Wear chemical splash goggles when there is the potential for exposure of the eyes to liquid, vapor or mist.
ETHYLENE GLYCOL
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Skin and body protection

Wear resistant gloves such as:
Natural Rubber
Neoprene
Nitrile rubber
polyvinyl chloride
polyvinyl alcohol
Polyethylene

Wear normal work clothing including long pants, long-sleeved shirts and foot covering to prevent direct contact of the product with the skin. Launder clothing before reuse. If skin irritation develops, contact your facility health and safety professional or your local safety equipment supplier to determine the proper personal protective equipment for your use.
Discard gloves that show tears, pinholes, or signs of wear.

Respiratory protection

A NIOSH-approved air-purifying respirator with an appropriate cartridge and/or filter may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits (if applicable) or if overexposure has otherwise been determined. Protection provided by air-purifying respirators is limited. Use a positive pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known or any other circumstances where an air-purifying respirator may not provide adequate protection.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Physical state</th>
<th>liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Form</td>
<td>viscous</td>
</tr>
<tr>
<td>Colour</td>
<td>colourless</td>
</tr>
<tr>
<td>Odour</td>
<td>mild, sweet</td>
</tr>
<tr>
<td>Boiling point/burning range</td>
<td>387.7 °F / 197.6 °C @ 101.32 kPa</td>
</tr>
<tr>
<td>Melting point/range</td>
<td>9 °F / -13 °C</td>
</tr>
<tr>
<td>Sublimation point</td>
<td>no data available</td>
</tr>
<tr>
<td>pH</td>
<td>no data available</td>
</tr>
<tr>
<td>Flash point</td>
<td>232 °F / 111 °C Closed Cup</td>
</tr>
<tr>
<td>Ignition temperature</td>
<td>no data available</td>
</tr>
<tr>
<td>Evaporation rate</td>
<td>(&lt;)1.00 n-Butyl Acetate</td>
</tr>
<tr>
<td>Lower explosion limit/Upper explosion limit</td>
<td>3.2 %(V) / 15.3 %(V)</td>
</tr>
<tr>
<td>Particle size</td>
<td>no data available</td>
</tr>
<tr>
<td>Vapour pressure</td>
<td>0.012 kPa @ 77 °F / 25 °C</td>
</tr>
</tbody>
</table>
10. STABILITY AND REACTIVITY

Stability

Stable.

Conditions to avoid

excessive heat

Incompatible products

Acids, Aldehydes, Alkali metals, Alkaline earth metals, Bases, strong alkalis, Strong oxidizing agents, Sulphur compounds

Hazardous decomposition products

carbon dioxide and carbon monoxide, Aldehydes, ketones, Organic acids, Alcohols, ethers, Hydrocarbons

Hazardous reactions

Product will not undergo hazardous polymerization.

Thermal decomposition

No data
## 11. TOXICOLOGICAL INFORMATION

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Acute oral toxicity</strong></td>
<td><strong>LD 50 Rat:</strong> 6,140 mg/kg</td>
</tr>
<tr>
<td><strong>Acute inhalation toxicity</strong></td>
<td><strong>ETHYLENE GLYCOL:</strong> no data available</td>
</tr>
<tr>
<td></td>
<td><strong>DIETHYLENE GLYCOL:</strong> LC Lo Mouse: 130 mg/m³; 2 h</td>
</tr>
<tr>
<td><strong>Acute dermal toxicity</strong></td>
<td><strong>LD 50 Rabbit:</strong> 9,530 mg/kg</td>
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</table>

## 12. ECOLOGICAL INFORMATION

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td><strong>Biodegradability</strong></td>
<td><strong>ETHYLENE GLYCOL:</strong> no data available</td>
</tr>
<tr>
<td></td>
<td><strong>DIETHYLENE GLYCOL:</strong> 92 % Exposure time: 28 d</td>
</tr>
<tr>
<td><strong>Bioaccumulation</strong></td>
<td><strong>ETHYLENE GLYCOL:</strong> Species: Crayfish (Procambarus) Exposure time: 61 d Dose: 1,000 mg/L Bioconcentration factor (BCF): 0.27 Method: Flow through</td>
</tr>
<tr>
<td></td>
<td><strong>DIETHYLENE GLYCOL:</strong> no data available</td>
</tr>
<tr>
<td><strong>Ecotoxicity effects</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Toxicity to fish</strong></td>
<td></td>
</tr>
<tr>
<td><strong>ETHYLENE GLYCOL</strong></td>
<td><strong>96 h LC 50 Bluegill (Lepomis macrochirus):</strong> 27,540.00 mg/L Method: Static; Mortality 96 h LC 50 Fathead minnow (Pimephales promelas): 8,050.00 mg/L; Mortality</td>
</tr>
<tr>
<td></td>
<td><strong>DIETHYLENE GLYCOL:</strong> 96 h LC 50 Western mosquitofish (Gambusia affinis): &gt; 32,000.00 mg/L Method: Static; Mortality</td>
</tr>
</tbody>
</table>
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Toxicity to daphnia and other aquatic invertebrates.
ETHYLENE GLYCOL : 48 h LC 50 Water flea (Daphnia magna): > 10,000.00 mg/L Method: Static Mortality
DIETHYLENE GLYCOL : 24 h LC 50 Water flea (Daphnia magna): > 10,000.00 mg/L Method: Static Mortality

Toxicity to algae
ETHYLENE GLYCOL : no data available
DIETHYLENE GLYCOL : no data available

Toxicity to bacteria
ETHYLENE GLYCOL : no data available
DIETHYLENE GLYCOL : no data available

Biochemical Oxygen Demand (BOD)
ETHYLENE GLYCOL : no data available
DIETHYLENE GLYCOL : no data available

Chemical Oxygen Demand (COD)
ETHYLENE GLYCOL : no data available
DIETHYLENE GLYCOL : no data available

Additional ecological information
ETHYLENE GLYCOL : no data available
DIETHYLENE GLYCOL : no data available

13. DISPOSAL CONSIDERATIONS

Waste disposal methods
For assistance with your waste management needs - including disposal, recycling and waste stream reduction, contact Ashland Distribution's Environmental Services Group at 800-637-7922.

14. TRANSPORT INFORMATION
### REGULATION

<table>
<thead>
<tr>
<th>ID NUMBER</th>
<th>PROPER SHIPPING NAME</th>
<th>*HAZARD CLASS</th>
<th>SUBSIDIARY HAZARDS</th>
<th>PACKING GROUP</th>
<th>MARINE POLLUTANT / LTD. QTY.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>U.S. DOT - ROAD</strong></td>
<td></td>
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<tr>
<td></td>
<td>Not dangerous goods</td>
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<tr>
<td></td>
<td><strong>U.S. DOT - RAIL</strong></td>
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<td></td>
<td>Not dangerous goods</td>
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<tr>
<td></td>
<td><strong>U.S. DOT - INLAND WATERWAYS</strong></td>
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<td></td>
<td>Not dangerous goods</td>
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<td><strong>TRANSPORT CANADA - ROAD</strong></td>
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<td>Not dangerous goods</td>
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<td><strong>TRANSPORT CANADA - RAIL</strong></td>
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<td>Not dangerous goods</td>
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<td><strong>TRANSPORT CANADA - INLAND WATERWAYS</strong></td>
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<td></td>
<td>Not dangerous goods</td>
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<tr>
<td></td>
<td><strong>INTERNATIONAL MARITIME DANGEROUS GOODS</strong></td>
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<td></td>
<td>Not dangerous goods</td>
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<tr>
<td></td>
<td><strong>INTERNATIONAL AIR TRANSPORT ASSOCIATION - CARGO</strong></td>
<td></td>
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<td></td>
<td>Not dangerous goods</td>
<td></td>
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<tr>
<td></td>
<td><strong>INTERNATIONAL AIR TRANSPORT ASSOCIATION - PASSENGER</strong></td>
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<tr>
<td></td>
<td>Not dangerous goods</td>
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<tr>
<td></td>
<td><strong>MEXICAN REGULATION FOR THE LAND TRANSPORT OF HAZARDOUS MATERIALS AND WASTES</strong></td>
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<tr>
<td></td>
<td>Not dangerous goods</td>
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</tbody>
</table>

*ORM = ORM-D, CBL = COMBUSTIBLE LIQUID

Dangerous goods descriptions (if indicated above) may not reflect quantity, end-use or region-specific exceptions that can be applied. Consult shipping documents for descriptions that are specific to the shipment.
15. REGULATORY INFORMATION

California Prop. 65
WARNING! This product contains a chemical known to the State of California to cause cancer.

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4-DIOXANE</td>
<td></td>
</tr>
<tr>
<td>ACETALDEHYDE</td>
<td></td>
</tr>
</tbody>
</table>

SARA Hazard Classification
Acute Health Hazard

SARA 313 Component(s)
ETHYLENE GLYCOL 100.00 %

New Jersey RTK Label Information
ETHYLENE GLYCOL 107-21-1

Pennsylvania RTK Label Information
ETHYLENE GLYCOL 107-21-1

Notification status
Australia. Industrial Chemical (Notification and Assessment) y (positive listing)
Act
China. Inventory of Existing Chemical Substances y (positive listing)
Japan. Kashin-Hou Law List y (positive listing)
New Zealand. Composite List of Single Component Substances to be considered for Transfer y (positive listing)
US. Toxic Substances Control Act y (positive listing)
EU. EINECS y (positive listing)
Korea. Toxic Chemical Control Law (TCCL) List y (positive listing)
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Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act
Japan. Industrial Safety & Health Law (ISHL) List
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand
New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand

Reportable quantity - Product
US. EPA CERCLA Hazardous Substances (40 CFR 302) 5000 lbs

Reportable quantity-Components
ETHYLENE GLYCOL 107-21-1 5000 lbs

<table>
<thead>
<tr>
<th></th>
<th>HMIS</th>
<th>NFPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Health</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Flammability</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Physical hazards</td>
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<td></td>
</tr>
<tr>
<td>Instability</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Specific Hazard</td>
<td>--</td>
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</tr>
</tbody>
</table>

16. OTHER INFORMATION

The information accumulated herein is believed to be accurate but is not warranted to be whether originating with the company or not. Recipients are advised to confirm in advance of need that the information is current, applicable, and suitable to their circumstances. This MSDS has been prepared by Ashland's Environmental Health and Safety Department (1-800-325-3751).