SAFETY DATA SHEET

1. Identification

Product Name Ethylene glycol

Cat No. E178-1; E178-4; E178-200; E178-500

CAS-No 107-21-1

Synonyms Monoethylene glycol; 1,2-Ethanediol

Recommended Use Laboratory chemicals.

Uses advised against Not for food, drug, pesticide or biocidal product use

Details of the supplier of the safety data sheet

Company Fisher Scientific
Importor/Distributor 112 Colonnade Road,
Fisher Scientific Ottawa, ON K2E 7L6,
Canada
Tel: 1-800-234-7437

Manufacturer Fisher Scientific
One Reagent Lane
Fair Lawn, NJ 07410
Tel: (201) 796-7100

Emergency Telephone Number
CHEMTREC®, Inside the USA: 800-424-9300
CHEMTREC®, Outside the USA: 001-703-527-3887

2. Hazard(s) identification

WHMIS 2015 Classification Classified as hazardous under the Hazardous Products Regulations (SOR/2015-17)

Acute oral toxicity Category 4
Specific target organ toxicity (single exposure) Category 3
Target Organs - Central nervous system (CNS).
Specific target organ toxicity - (repeated exposure) Category 2
Target Organs - Kidney, Liver.

Label Elements

Signal Word Warning

Hazard Statements
Harmful if swallowed
May cause drowsiness and dizziness
May cause damage to organs through prolonged or repeated exposure
Precautionary Statements

Prevention
Do not breathe dust/fumes/gas/mist/vapours/spray
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product
Use only outdoors or in a well-ventilated area

Response
IF INHALED: Remove person to fresh air and keep comfortable for breathing
Call a POISON CENTER/ doctor if you feel unwell
Rinse mouth

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

Disposal
Dispose of contents/container to an approved waste disposal plant

3. Composition/Information on Ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>&gt;95</td>
</tr>
</tbody>
</table>

4. First-aid measures

Eye Contact
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.

Skin Contact
Wash off immediately with plenty of water for at least 15 minutes. Get medical attention immediately if symptoms occur.

Inhalation
Move to fresh air. Do not use mouth-to-mouth method if victim ingested or inhaled the substance; give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Get medical attention immediately if symptoms occur. If not breathing, give artificial respiration.

Ingestion
Do not induce vomiting. Call a physician or Poison Control Center immediately.

Most important symptoms/effects
Breathing difficulties.

Notes to Physician
Treat symptomatically

5. Fire-fighting measures

Suitable Extinguishing Media
Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

Unsuitable Extinguishing Media
No information available

Flash Point
111 °C / 231.8 °F

Method -
DIN 51758
Ethylene glycol

Autoignition Temperature 413 °C / 775.4 °F

Explosion Limits
- Upper: 15.30 vol %
- Lower: 3.20 vol %

Sensitivity to Mechanical Impact: No information available

Sensitivity to Static Discharge: No information available

Specific Hazards Arising from the Chemical
Thermal decomposition can lead to release of irritating gases and vapors. Keep product and empty container away from heat and sources of ignition.

Hazardous Combustion Products
Carbon monoxide (CO) Carbon dioxide (CO₂)

Protective Equipment and Precautions for Firefighters
As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

NFPA

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Instability</th>
<th>Physical hazards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>1</td>
<td>N/A</td>
</tr>
</tbody>
</table>

6. Accidental release measures

Personal Precautions
Ensure adequate ventilation. Use personal protective equipment.

Environmental Precautions
Should not be released into the environment. See Section 12 for additional ecological information.

Methods for Containment and Clean Up
Soak up with inert absorbent material. Keep in suitable, closed containers for disposal.

7. Handling and storage

Handling
Wear personal protective equipment. Ensure adequate ventilation. Do not breathe vapors or spray mist. Avoid contact with skin, eyes and clothing.

Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Keep away from heat and sources of ignition.

8. Exposure controls / personal protection

<table>
<thead>
<tr>
<th>Component</th>
<th>Alberta</th>
<th>British Columbia</th>
<th>Ontario TWAEV</th>
<th>Quebec</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Ceiling: 100 mg/m³</td>
<td>TWA: 10 mg/m³</td>
<td>Ceiling: 100 mg/m³</td>
<td>Ceiling: 50 ppm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>STEL: 20 mg/m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ceiling: 100 mg/m³</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Legend
ACGIH - American Conference of Governmental Industrial Hygienists
OSHA - Occupational Safety and Health Administration

Engineering Measures
Ensure adequate ventilation, especially in confined areas. Ensure that eyewash stations and safety showers are close to the workstation location.
Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.
Personal protective equipment

Eye Protection
Wear appropriate protective eyeglasses or chemical safety goggles as described by OSHA’s eye and face protection regulations in 29 CFR 1910.133 or European Standard EN166.

Hand Protection
Wear appropriate protective gloves and clothing to prevent skin exposure.

<table>
<thead>
<tr>
<th>Glove material</th>
<th>Breakthrough time</th>
<th>Glove thickness</th>
<th>Glove comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Viton (R)</td>
<td>See manufacturers recommendations</td>
<td>-</td>
<td>Splash protection only</td>
</tr>
</tbody>
</table>

Inspect gloves before use. observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information) gloves are suitable for the task: Chemical compatability, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. gloves with care avoiding skin contamination.

Respiratory Protection
When workers are facing concentrations above the exposure limit they must use appropriate certified 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. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly

Recommended Filter type: Organic gases and vapours filter Type A Brown conforming to EN14387

When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls
No information available.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice. Keep away from food, drink and animal feeding stuffs. Do not eat, drink or smoke when using this product. Remove and wash contaminated clothing before re-use. Wash hands before breaks and at the end of workday.

9. Physical and chemical properties

<table>
<thead>
<tr>
<th>Physical State</th>
<th>Viscous liquid Liquid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>No information available</td>
</tr>
<tr>
<td>pH</td>
<td>5.5-7.5  50% aq. sol</td>
</tr>
<tr>
<td>Melting Point/Range</td>
<td>-13 °C / 8.6 °F</td>
</tr>
<tr>
<td>Boiling Point/Range</td>
<td>196 - 198 °C / 384.8 - 388.4 °F @ 760 mmHg</td>
</tr>
<tr>
<td>Flash Point</td>
<td>111 °C / 231.8 °F</td>
</tr>
<tr>
<td>Method -</td>
<td>DIN 51758</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>No information available</td>
</tr>
<tr>
<td>Flammability (solid,gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Flammability or explosive limits</td>
<td></td>
</tr>
<tr>
<td>Upper</td>
<td>15.30 vol %</td>
</tr>
<tr>
<td>Lower</td>
<td>3.20 vol %</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>0.12 mmHg @ 20 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>2.14 (Air = 1.0)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.113</td>
</tr>
<tr>
<td>Solubility</td>
<td>miscible</td>
</tr>
<tr>
<td>Partition coefficient; n-octanol/water</td>
<td>No data available</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>413 °C / 775.4 °F</td>
</tr>
<tr>
<td>Decomposition Temperature</td>
<td>&gt; 500°C</td>
</tr>
<tr>
<td>Viscosity</td>
<td>21 cP (20°C)</td>
</tr>
<tr>
<td>Molecular Formula</td>
<td>C2 H6 O2</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>62.06</td>
</tr>
</tbody>
</table>
10. Stability and reactivity

Reactive Hazard

None known, based on information available

Stability

Hygroscopic.

Conditions to Avoid

Incompatible products. Excess heat. Exposure to moist air or water.

Incompatible Materials

Strong oxidizing agents, Strong acids, Strong bases, Aldehydes

Hazardous Decomposition Products

Carbon monoxide (CO), Carbon dioxide (CO₂)

Hazardous Polymerization

Hazardous polymerization does not occur.

Hazardous Reactions

None under normal processing.

11. Toxicological information

Acute Toxicity

Product Information

Component Information

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>7712 mg/kg (Rat)</td>
<td>9530 µL/kg (Rabbit)</td>
<td>10600 mg/kg (Rat)</td>
</tr>
</tbody>
</table>

Toxicologically Synergistic Products

No information available

Delayed and immediate effects as well as chronic effects from short and long-term exposure

Irritation

May cause eye, skin, and respiratory tract irritation

Sensitization

No information available

Carcinogenicity

The table below indicates whether each agency has listed any ingredient as a carcinogen.

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>IARC</th>
<th>NTP</th>
<th>ACGIH</th>
<th>OSHA</th>
<th>Mexico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
<td>Not listed</td>
</tr>
</tbody>
</table>

Mutagenic Effects

No information available

Reproductive Effects

No information available.

Developmental Effects

No information available.

Teratogenicity

No information available.

STOT - single exposure

Central nervous system (CNS)

STOT - repeated exposure

Kidney Liver

Aspiration hazard

No information available

Symptoms / effects, both acute and delayed

No information available

Endocrine Disruptor Information

No information available

Other Adverse Effects

The toxicological properties have not been fully investigated.

12. Ecological information

Ecotoxicity

Do not empty into drains.
<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Algae</th>
<th>Freshwater Fish</th>
<th>Microtox</th>
<th>Water Flea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>EC50: 6500 - 13000 mg/L, 96h (Pseudokirchneriella subcapitata)</td>
<td>LC50: = 16000 mg/L, 96h static (Poecilia reticulata)</td>
<td>Not listed</td>
<td>EC50: = 46300 mg/L, 48h (Daphnia magna)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50: 40000 - 60000 mg/L, 96h static (Pimephales promelas)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50: = 40761 mg/L, 96h static (Oncorhynchus mykiss)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50: = 41000 mg/L, 96h (Oncorhynchus mykiss)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50: 14 - 18 mL/L, 96h static (Oncorhynchus mykiss)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LC50: = 27540 mg/L, 96h static (Lepomis macrochirus)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Persistence and Degradability**
Persistence is unlikely

**Bioaccumulation/Accumulation**
No information available.

**Mobility**
Will likely be mobile in the environment due to its water solubility.

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>-1.93</td>
</tr>
</tbody>
</table>

### 13. Disposal considerations

**Waste Disposal Methods**
Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations to ensure complete and accurate classification.

### 14. Transport information

**DOT**
Not regulated

**TDG**
Not regulated

**IATA**
Not regulated

**IMDG/IMO**
Not regulated

### 15. Regulatory information

All of the components in the product are on the following Inventory lists: X = listed

**International Inventories**

<table>
<thead>
<tr>
<th>Component</th>
<th>DSL</th>
<th>NDSL</th>
<th>TSCA</th>
<th>EINECS</th>
<th>ELINCS</th>
<th>NLP</th>
<th>PICCS</th>
<th>ENCS</th>
<th>AICS</th>
<th>IECSC</th>
<th>KECL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>X</td>
<td>-</td>
<td>X</td>
<td>203-473-3</td>
<td>-</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

**Canada**

SDS in compliance with provisions of information as set out in Canadian Standard - Part 4, Schedule 1 and 2 of the Hazardous Products Regulations (HPR) and meets the requirements of the HPR (Paragraph 13(1)(a) of the Hazardous Products Act (HPA)).

<table>
<thead>
<tr>
<th>Component</th>
<th>Canada - National Pollutant Release Inventory (NPRI)</th>
<th>Canadian Environmental Protection Agency (CEPA) - List of Toxic Substances</th>
<th>Canada’s Chemicals Management Plan (CEPA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>Part 1, Group A Substance</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 16. Other information

**Prepared By**
Regulatory Affairs
Thermo Fisher Scientific
Ethylene glycol

Email: EMSDS.RA@thermofisher.com

Creation Date 02-February-2010
Revision Date 17-January-2018
Print Date 17-January-2018
Revision Summary This document has been updated to comply with the requirements of WHMIS 2015 to align with the Globally Harmonised System (GHS) for the Classification and Labelling of Chemicals.

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text

End of SDS