1. Identification

Product identifier  EP™ 2000 Flow Improver
Other means of identification  None.
Recommended use  Flow Improver.
Recommended restrictions  Other uses are not recommended unless an assessment demonstrates potential exposures will be controlled.

Manufacturer/Importer/Supplier/Distributor information
Manufacturer  LiquidPower Specialty Products Inc.
Address  One BriarLake Plaza
          2000 W Sam Houston Pkwy S
          Suite 400
          Houston, TX 77042
Telephone  1.713.339.8703 or 1.800.897.2774
e-mail  SDS@LiquidPower.com
Website  www.LiquidPower.com
Emergency telephone  +1 703.527.3887
                     +1 800.424.9300

2. Hazard(s) identification

Physical hazards  Not classified.
Health hazards  Specific target organ toxicity, repeated exposure  Category 2 (kidneys)
Environmental hazards  Hazardous to the aquatic environment, long-term hazard  Category 3
OSHA defined hazards  Not classified.

Label elements

Signal word  Warning
Hazard statement  May cause damage to organs (kidneys) through prolonged or repeated exposure. Harmful to aquatic life with long lasting effects.
Precautionary statement
Prevention  Do not breathe mist or vapor. Avoid release to the environment.
Response  Get medical advice/attention if you feel unwell.
Storage  Store away from incompatible materials.
Disposal  Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)  None known.
Supplemental information  None.

3. Composition/information on ingredients

Mixtures

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>10-30</td>
</tr>
<tr>
<td>C11-C15 Hydrocarbon Solvent</td>
<td>Proprietary</td>
<td>&lt;10</td>
</tr>
</tbody>
</table>
Surfactant

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohols, C12 - C14 secondary, ethoxylated</td>
<td>84133-50-6</td>
<td>0-6</td>
</tr>
<tr>
<td>Alcohol Ethoxylate 2</td>
<td>Proprietary</td>
<td>0-6</td>
</tr>
<tr>
<td>Alcohol Ethoxylate 1</td>
<td>Proprietary</td>
<td>0-6</td>
</tr>
</tbody>
</table>

*Designates that a specific chemical identity and/or percentage of composition has been withheld as a trade secret.

Composition comments

Total alcohol ethoxylate concentration <6%.

All concentrations are in percent by weight. Components not listed are either non-hazardous or are below reportable limits.

4. First-aid measures

Inhalation
Get medical attention if discomfort persists.

Skin contact
Wash off with soap and water. Get medical attention if irritation develops and persists.

Eye contact
Flush thoroughly with water. If irritation occurs, get medical assistance.

Ingestion
Rinse mouth. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed
Direct contact with eyes may cause temporary irritation. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed
Treat symptomatically. Symptoms may be delayed.

5. Fire-fighting measures

Suitable extinguishing media
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
Move containers from fire area if you can do so without risk.

Specific methods
Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards
No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe mist or vapor. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up
Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Environmental precautions
Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling
Do not breathe mist or vapor. Avoid prolonged exposure. Provide adequate ventilation. Wear appropriate personal protective equipment. Avoid release to the environment. Observe good industrial hygiene practices.
Conditions for safe storage, including any incompatibilities

Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
<th>Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>C11-C15 Hydrocarbon Solvent</td>
<td>TWA</td>
<td>200 mg/m3</td>
<td>Non-aerosol.</td>
</tr>
<tr>
<td>Ethylene glycol (CAS 107-21-1)</td>
<td>STEL</td>
<td>10 mg/m3</td>
<td>Aerosol, inhalable.</td>
</tr>
<tr>
<td></td>
<td>TWA</td>
<td>50 ppm</td>
<td>Vapor fraction</td>
</tr>
<tr>
<td></td>
<td></td>
<td>25 ppm</td>
<td>Vapor fraction</td>
</tr>
</tbody>
</table>

US. NIOSH: Pocket Guide to Chemical Hazards

<table>
<thead>
<tr>
<th>Components</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>C11-C15 Hydrocarbon Solvent</td>
<td>TWA</td>
<td>100 mg/m3</td>
</tr>
</tbody>
</table>

Biological limit values

No biological exposure limits noted for the ingredient(s).

Exposure guidelines

US ACGIH Threshold Limit Values: Skin designation
C11-C15 Hydrocarbon Solvent (CAS Proprietary) Can be absorbed through the skin.

Appropriate engineering controls

Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection
Wear safety glasses with side shields (or goggles).

Skin protection
Hand protection
Wear appropriate chemical resistant gloves.

Skin protection
Other
Normal work clothing (long sleeved shirts and long pants) is recommended.

Respiratory protection
In case of accident and/or inadequate ventilation, use respiratory protection with organic vapor cartridge.

Thermal hazards
Not applicable.

General hygiene considerations
Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance
Physical state
Liquid.
Form
Liquid.
Color
White.

Odor
Mild petroleum odor.

Odor threshold
No data available.

pH
6 - 8

Melting point/freezing point
-9 °F (-22.78 °C)

Initial boiling point and boiling range
222 °F (105.6 °C)

Flash point
> 200.0 °F (> 93.3 °C) Pensky-Martens Closed Cup ASTM D93, EPA 1010

Evaporation rate
Same as water.

Flammability (solid, gas)
Not applicable.
Upper/lower flammability or explosive limits

- Flammability limit - lower (%): Not available.
- Flammability limit - upper (%): Not available.
- Explosive limit - lower (%): No data available.
- Explosive limit - upper (%): No data available.

Vapor pressure: 24 mm Hg @ 100°F / 37.8°C (estimate)
Vapor density: < 1
Relative density: 1 - 1.02 @ 68°F (20°C)
Solubility (water): Disperses completely.
Partition coefficient (n-octanol/water): Not available.
Auto-ignition temperature: No data available.
Decomposition temperature: No data available.
Viscosity: 85 cP @ 511s⁻¹ @ 77°F (Non-newtonian).

Other information

- Bulk density: Not determined.
- Explosive properties: Not explosive.
- Oxidizing properties: Not oxidizing.
- Particle size: Not applicable.
- Percent volatile: No data available.

10. Stability and reactivity

Reactivity: The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability: Material is stable under normal conditions.
Possibility of hazardous reactions: No dangerous reaction known under conditions of normal use.
Conditions to avoid: Avoid temperatures exceeding the flash point. Contact with incompatible materials.
Incompatible materials: Strong oxidizing agents.
Hazardous decomposition products: No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

- Inhalation: No adverse effects due to inhalation are expected.
- Skin contact: Prolonged skin contact may cause temporary irritation.
- Eye contact: Direct contact with eyes may cause temporary irritation.
- Ingestion: Under normal conditions of intended use, this material does not pose a risk to health. However: Ingestion of ethylene glycol may result in nausea, vomiting, abdominal cramps, blindness, liver damage, irritation, reproductive effects, nerve damage, convulsions, edema of the lung, cardiopulmonary effects (metabolic acidosis), pneumonia and kidney failure which could result in death. The single lethal dose of ethylene glycol for humans is about 100 ml. Inhalation of high levels of vapors or mists for prolonged periods of time may also result in toxic effects.

Symptoms related to the physical, chemical and toxicological characteristics: Direct contact with eyes may cause temporary irritation.

Information on toxicological effects

Acute toxicity: May be harmful if swallowed.
## Test Results

### Components Species Test Results

**Ethylene glycol (CAS 107-21-1)**

<table>
<thead>
<tr>
<th>Acute</th>
<th>Dermal</th>
<th>LD50</th>
<th>Rabbit</th>
<th>9530 mg/kg</th>
</tr>
</thead>
</table>

**Skin corrosion/irritation**

Prolonged skin contact may cause temporary irritation.

**Serious eye damage/eye irritation**

Direct contact with eyes may cause temporary irritation.

### Respiratory or skin sensitization

- **Respiratory sensitization**
  
  No information available on the mixture. However, none of the components are classified in respect of this hazard (or are present at a level below the concentration threshold for classification).

- **Skin sensitization**
  
  No information available on the mixture. However, none of the components are classified in respect of this hazard (or are present at a level below the concentration threshold for classification).

- **Germ cell mutagenicity**
  
  No information available on the mixture. However, none of the components are classified in respect of this hazard (or are present at a level below the concentration threshold for classification).

- **Carcinogenicity**
  
  No information available on the mixture. However, none of the components are classified in respect of this hazard (or are present at a level below the concentration threshold for classification).

- **IARC Monographs. Overall Evaluation of Carcinogenicity**
  
  Not listed.

- **NTP Report on Carcinogens**
  
  Not listed.

  
  Not listed.

- **Reproductive toxicity**
  
  No information available on the mixture. However, none of the components are classified in respect of this hazard (or are present at a level below the concentration threshold for classification).

- **Specific target organ toxicity - single exposure**
  
  No information available on the mixture. However, none of the components are classified in respect of this hazard (or are present at a level below the concentration threshold for classification).

- **Specific target organ toxicity - repeated exposure**
  
  May cause damage to organs (kidneys) through prolonged or repeated exposure.

- **Aspiration hazard**
  
  Not an aspiration hazard.

- **Chronic effects**
  
  Prolonged exposure may cause chronic effects.

- **Further information**
  
  Ingestion of ethylene glycol may result in nausea, vomiting, abdominal cramps, blindness, liver damage, irritation, reproductive effects, nerve damage, convulsions, edema of the lung, cardiopulmonary effects (metabolic acidosis), pneumonia and kidney failure which could result in death. The single lethal dose for humans is about 100 ml. Inhalation of high levels of vapors or mists for prolonged periods of time may also result in toxic effects.

### 12. Ecological information

**Ecotoxicity**

Harmful to aquatic life with long lasting effects.

| Components Species Test Results |
|-------------------------------|-----------------|
| Ethylene glycol (CAS 107-21-1) |                |
| Aquatic                       |                |
| Acute                         |                |
| Crustacea                     | EC50 Ceriodaphnia dubia 10000 mg/l, 48 Hours |
| Fish                          | LC50 Oncorhynchus mykiss 24591 mg/l, 96 Hours |
| Chronic                       |                |
| Crustacea                     | NOEC Ceriodaphnia dubia 3469 mg/l, 7 days |
| Fish                          | NOEC Oncorhynchus mykiss 14692 mg/l, 12 days |

**Persistence and degradability**

Not expected to persist in the environment if spilled or released.

**Bioaccumulative potential**

The product is not expected to bioaccumulate.
Partition coefficient n-octanol / water (log Kow)
Ethylene glycol (CAS 107-21-1) -1.36

Mobility in soil
Expected to have low mobility in soil and sediments with adsorption being the predominant physical process.

Other adverse effects
No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations
Disposal instructions
Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations. Waste material from this product should not be exposed to waste streams or sumps containing any concentration of hydrocarbon. This will cause formation of gelled substances that may plug pipes.

Local disposal regulations
Dispose in accordance with all applicable regulations.

Hazardous waste code
The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

Waste from residues / unused products
Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging
Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information

DOT
Not regulated as dangerous goods.

DOT BULK

BULK

UN number
NA3082

UN proper shipping name
Other regulated substances, liquid, n.o.s. (Ethylene glycol RQ = 5000 lbs)

Transport hazard class(es)
Class: 9
Label(s): 9

Packing group
III

Environmental hazards
No

Marine pollutant
No

Special precautions for user
Read safety instructions, SDS and emergency procedures before handling.
Special provisions
IB3, T2, TP1

Packaging exceptions
155

Packaging non bulk
203

Packaging bulk
241

IATA
Not regulated as dangerous goods.

IMDG
Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Not established.

15. Regulatory information

US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)
Ethylene glycol (CAS 107-21-1) Listed.

SARA 304 Emergency release notification
Not regulated.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Toxic Substances Control Act (TSCA)

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical

Yes

Specific target organ toxicity (single or repeated exposure)

SARA 313 (TRI reporting)

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethylene glycol</td>
<td>107-21-1</td>
<td>10-30</td>
</tr>
</tbody>
</table>

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Ethylene glycol (CAS 107-21-1)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA)

Contains component(s) regulated under the Safe Drinking Water Act.

US state regulations

US. Massachusetts RTK - Substance List

C11-C15 Hydrocarbon Solvent (CAS Proprietary)

Ethylene glycol (CAS 107-21-1)

US. New Jersey Worker and Community Right-to-Know Act

C11-C15 Hydrocarbon Solvent (CAS Proprietary)

Ethylene glycol (CAS 107-21-1)

US. Pennsylvania Worker and Community Right-to-Know Law

C11-C15 Hydrocarbon Solvent (CAS Proprietary)

Ethylene glycol (CAS 107-21-1)

US. Rhode Island RTK

C11-C15 Hydrocarbon Solvent (CAS Proprietary)

Ethylene glycol (CAS 107-21-1)

International Inventories

<table>
<thead>
<tr>
<th>Country(s) or region</th>
<th>Inventory name</th>
<th>On inventory (yes/no)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Inventory of Chemical Substances (AICS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Domestic Substances List (DSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>Canada</td>
<td>Non-Domestic Substances List (NDSL)</td>
<td>Yes</td>
</tr>
<tr>
<td>China</td>
<td>Inventory of Existing Chemical Substances in China (IECSC)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European Inventory of Existing Commercial Chemical Substances (EINECS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Europe</td>
<td>European List of Notified Chemical Substances (ELINCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Japan</td>
<td>Inventory of Existing and New Chemical Substances (ENCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Korea</td>
<td>Existing Chemicals List (ECL)</td>
<td>Yes</td>
</tr>
<tr>
<td>New Zealand</td>
<td>New Zealand Inventory</td>
<td>Yes</td>
</tr>
<tr>
<td>Philippines</td>
<td>Philippine Inventory of Chemicals and Chemical Substances (PICCS)</td>
<td>Yes</td>
</tr>
<tr>
<td>Taiwan</td>
<td>Taiwan Chemical Substance Inventory (TCSI)</td>
<td>No</td>
</tr>
<tr>
<td>United States &amp; Puerto Rico</td>
<td>Toxic Substances Control Act (TSCA) Inventory</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date: 25-April-2017
NFPA Hazard Scale: 0 = Minimal  1 = Slight  2 = Moderate  3 = Serious  4 = Severe

List of abbreviations
LD50: Lethal Dose, 50%.
LC50: Lethal Concentration, 50%.
EC50: Effective Concentration, 50%.
NOEC: No observed effect concentration.

References
HSDB® - Hazardous Substances Data Bank
IARC Monographs. Overall Evaluation of Carcinogenicity

Disclaimer
LiquidPower Specialty Products Inc. cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.