SAFETY DATA SHEET

1. Identification

Product identifier LP™ Arctic Grade™ Flow Improver
Other means of identification None.
Recommended use of the chemical and restrictions on use
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.
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e-mail SDS@LiquidPower.com
Website www.LiquidPower.com
Emergency telephone +1 703.527.3887 (USA)
+1 800.424.9300 (USA)
Singapore only 800-101-2201
+(65)-31581349

2. Hazards identification

GHS classification
Physical hazards Not classified.
Health hazards Serious eye damage/eye irritation Category 2A
Environmental hazards Not classified.

GHS label elements, including precautionary statements
Pictograms

Signal word Warning
Hazard statements Causes serious eye irritation.
Precautionary statements
Prevention Keep away from flames and hot surfaces. No smoking. Wash thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection.
Response IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Storage Store in a well-ventilated place. Keep cool.
Disposal Dispose of contents/container in accordance with local/regional/national/international regulations.
Other hazards which do not result in classification None known.
Supplemental information None known.

3. Composition/information on ingredients

Substance or mixture Mixture

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS Number</th>
<th>Concentration (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohols, C7-9-iso-, C8-rich</td>
<td></td>
<td>68526-83-0</td>
<td>35 - 45</td>
</tr>
<tr>
<td>Octan-1-ol</td>
<td></td>
<td>111-87-5</td>
<td>2 - 10</td>
</tr>
</tbody>
</table>

Composition comments All concentrations are in percent by weight. Components not listed are either non-hazardous or are below reportable limits.
4. First-aid measures

**Inhalation**
Move to fresh air. Call a physician if symptoms develop or persist.

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

**Eye contact**
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

**Ingestion**
Rinse mouth. Get medical attention if symptoms occur.

**Most important symptoms/effects, acute and delayed**
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

**Indication of immediate medical attention and special treatment needed**
Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

**General information**
Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire-fighting measures

**Suitable extinguishing media**

**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.

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

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

**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 touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

**Environmental precautions**
Avoid discharge into drains, water courses or onto the ground.

**Methods and materials for containment and cleaning up**
Use water spray to reduce vapours or divert vapour cloud drift.

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.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the SDS.

7. Handling and storage

**Precautions for safe handling**
Avoid prolonged exposure. Avoid contact with eyes, skin, and clothing. Provide adequate ventilation. Wear appropriate personal protective equipment.

**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

**Control parameters/Occupational exposure limits**
No exposure limits noted for ingredient(s).

**Appropriate engineering control measures**
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. Provide eyewash station.

**Individual protection measures, such as personal protective equipment**
Wear safety glasses with side shields (or goggles). Wear face shield if there is risk of splashes.
Skin protection
Hand protection  Wear appropriate chemical resistant gloves. Suitable gloves can be recommended by the glove supplier.
Other  Normal work clothing (long sleeved shirts and long pants) is recommended.
Respiratory protection  If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.
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.
Colour  White.
Odour  Sweet, pungent.
Odour threshold  Not available.

Odour threshold  Not available.

pH  Not applicable.
Melting point/freezing point  < -40 °C (< -40 °F)
Initial boiling point and boiling range  185 °C (365 °F)
Flash point  83.0 °C (181.4 °F)
Evaporation rate  Less than water.
Flammability (solid, gas)  Not applicable.
Flammability limit - lower (%)  Not available.
Flammability limit - upper (%)  Not available.
Vapour pressure  1 mmHg (37.8°C)
Vapour density  < 1 (Air = 1)
Relative density  0.87 - 0.89 (15.6°C)
Solubility(ies)
Solubility (water)  Negligible in water.
Partition coefficient (n-octanol/water)  Not available.
Auto-ignition temperature  Not available.
Decomposition temperature  Not available.
Viscosity  150 cP @ 511s-1 (Non-Newtonian) (25 °C)
Other data
Explosive properties  Not explosive.
Oxidising properties  Not oxidising.

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 oxidising agents.
Hazardous decomposition products  Thermal decomposition or combustion may liberate carbon oxides and other toxic gases or vapours.

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  Causes serious eye irritation.
**Ingestion**
May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure.

**Acute toxicity**
Not expected to be acutely toxic.

<table>
<thead>
<tr>
<th>Components</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Octan-1-ol (CAS 111-87-5)</td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Dermal</strong></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Guinea pig  &gt; 500 mg/kg</td>
</tr>
<tr>
<td></td>
<td>Rabbit      &gt; 5 g/kg</td>
</tr>
<tr>
<td><strong>Oral</strong></td>
<td></td>
</tr>
<tr>
<td>LD50</td>
<td>Rat         &gt; 5 g/kg</td>
</tr>
</tbody>
</table>

**Symptoms**
Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision.

**Skin corrosion/irritation**
Prolonged skin contact may cause temporary irritation.

<table>
<thead>
<tr>
<th>Corrosivity</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP™ Arctic Grade™ Flow Improver</td>
<td>OECD 404 Result: Very slight irritant</td>
</tr>
<tr>
<td></td>
<td>Species: Rabbit</td>
</tr>
</tbody>
</table>

**Respiratory or skin sensitisation**
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).

**Respiratory sensitisation**
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 sensitisation**
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).

**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**
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).

**Aspiration hazard**
Not an aspiration hazard.

**Chronic effects**
None known.

**Relevant negative data**
No data available.

**Other information**
None known.

**12. Ecological information**
The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.

<table>
<thead>
<tr>
<th>Components</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohols, C7-9-iso-, C8-rich (CAS 68526-83-0)</td>
<td></td>
</tr>
<tr>
<td><strong>Aquatic</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Acute</strong></td>
<td></td>
</tr>
<tr>
<td>Algae</td>
<td>ErC50   Pseudokirchnerella subcapitata 23 mg/l, 72 h</td>
</tr>
<tr>
<td>Crustacea</td>
<td>LC50    Daphnia magna 31.8 mg/l, 48 h</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50    Pimephales promelas 14 mg/l, 96 h</td>
</tr>
<tr>
<td><strong>Chronic</strong></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>EC10    Ceriodaphnia dubia 0.28 mg/l, 6 day</td>
</tr>
<tr>
<td>Components</td>
<td>Species</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Fish</td>
<td>Pimephales promelas</td>
</tr>
<tr>
<td>Octan-1-ol (CAS 111-87-5)</td>
<td></td>
</tr>
<tr>
<td>Aquatic</td>
<td></td>
</tr>
<tr>
<td>Fish</td>
<td>Fathead minnow (Pimephales promelas)</td>
</tr>
</tbody>
</table>

**Persistence and degradability**
No data is available on the degradability of this product.

**Bioaccumulative potential**
The product is not expected to bioaccumulate.

**Octanol/water partition coefficient log Kow**
Octan-1-ol (CAS 111-87-5) 3

**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 methods/information**
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. Collect and reclaim or dispose in sealed containers at licensed waste disposal site.

**Special precautions**
Dispose in accordance with all applicable regulations.

### 14. Transport information

**ADR**
Not regulated as dangerous goods.

**RID**
Not regulated as dangerous goods.

**ADN**
Not regulated as dangerous goods.

**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

**Safety, health and environmental regulations specific for the product in question**

- **Controlled Narcotic Drugs (Misuse of Drugs Act, First Schedule, Part I, II & III)**
  Not regulated.

- **Controlled Specified Drugs (Misuse of Drugs Act, Fourth Schedule)**
  Not regulated.

  Not regulated.

- **Chemical Weapons Prohibition (Act)**
  Not applicable.

- **Environmental Protection and Management (Hazardous Substances) Regulations**
  Not applicable.

- **Environmental Public Health Act**
  Not applicable.

**International regulations**

- **Montreal Protocol**
  Not applicable.

- **Stockholm Convention**
  Not applicable.

- **Rotterdam Convention**
  Not applicable.

- **Kyoto Protocol**
  Not applicable.

- **Basel Convention**
  Not applicable.
### 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>No</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).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

### 16. Other information

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

**Issued by**
- Not available.

**Prepared by**
- Not available.

**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.

**Issue date**
- 16-May-2017

**Revision date**
- 09-February-2018

**Key/legend**
- Not applicable.