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

Product identifier
Product Name VYCERIN™ GL97 Antifreeze Grade 99.5% Vegetable Glycerine

Other means of identification
Product Code GL97

Recommended use of the chemical and restrictions on use
Recommended Use Multi-purpose fluid.

Details of the supplier of the safety data sheet
Manufacturer Address Vantage Oleochemicals, Inc.
4650 South Racine Avenue
Chicago, IL 60609 USA
+1-773-376-9000

Emergency Telephone Number
Company Phone Number +1-773-376-9000
Emergency Telephone Number CHEMTREC International +1-703-527-3887
CHEMTREC USA: 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification
This chemical is not considered hazardous by the 2012 OSHA Hazard Communication Standard.
This is not a dangerous substance or mixture according to the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Label Elements

EMERGENCY OVERVIEW

Color Colorless Physical State Liquid Odor Odorless

3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No.</th>
<th>Weight %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerin</td>
<td>56-81-5</td>
<td>99.5</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

FIRST AID MEASURES

Eye contact Consult a physician. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
Skin contact
Wash exposed skin with soap and plenty of water. Consult a physician if irritation occurs.

Inhalation
Remove to fresh air and keep at rest in a position comfortable for breathing. Consult a physician if breathing is difficult or other respiratory symptoms develop.

Ingestion
DO NOT induce vomiting. Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person.

Most important symptoms and effects, both acute and delayed

Symptoms
None identified.

Indication of any immediate medical attention and special treatment needed

Notes to Physician
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media
Use extinguishing measures appropriate to local circumstances and surrounding materials.

 Unsuitable extinguishing media
Do not use a solid water stream as it may scatter and spread fire.

Specific hazards arising from the chemical
Acrolein may be formed if product is burned or strongly heated, especially in acidic conditions.

Explosion Data
Sensitivity to Mechanical Impact
None.

Sensitivity to Static Discharge
None.

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.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal Precautions
Use personal protective equipment.

Environmental precautions

Environmental precautions
Prevent release to surface water.

Methods and material for containment and cleaning up

Methods for Containment
Dike to collect large liquid spills.

Methods for Cleaning Up
Absorb with an inert material.

7. HANDLING AND STORAGE

Precautions for safe handling

Handling
Handle in accordance with good industrial hygiene and safety practice. Avoid generation of mist/aerosol.

Conditions for safe storage, including any incompatibilities

Storage
Keep containers tightly closed in a cool, well-ventilated place.

Packaging Material
Store tightly closed in original container. Prevent exposure to high humidity, material is
Incompatible materials

Strong oxidizing agents.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure Guidelines

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerin 56-81-5</td>
<td>n/a</td>
<td>TWA: 15 mg/m³ (total)</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA: 5 mg/m³ (respirable fraction)</td>
<td></td>
</tr>
</tbody>
</table>

Appropriate engineering controls

Engineering Measures

Showers
Eyewash stations
Ventilation systems.

Individual protection measures, such as personal protective equipment

Eye/face Protection
Safety glasses with side-shields.

Skin and Body Protection
Impervious gloves.

Respiratory Protection
Use NIOSH/MSHA approved respirator if exposure limit is exceeded.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Values</th>
<th>Remarks • Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
<td></td>
</tr>
<tr>
<td>Appearance</td>
<td>Clear</td>
<td></td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
<td></td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
<td></td>
</tr>
<tr>
<td>pH</td>
<td>7</td>
<td>Neat</td>
</tr>
<tr>
<td>Melting point/freezing point</td>
<td>18 °C / 64 °F</td>
<td></td>
</tr>
<tr>
<td>Boiling point/boiling range</td>
<td>290 °C / 554 °F</td>
<td></td>
</tr>
<tr>
<td>Flash Point</td>
<td>177 °C / 351 °F</td>
<td></td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td></td>
<td>Open cup</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td></td>
<td>Not determined</td>
</tr>
<tr>
<td>Flammability Limits in Air</td>
<td></td>
<td>May burn if exposed to open flame.</td>
</tr>
<tr>
<td>Upper flammability limits</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Lower Flammability Limit</td>
<td>Not determined</td>
<td></td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>0.000106</td>
<td>hPa at (20 °C)</td>
</tr>
<tr>
<td>Vapor Density</td>
<td></td>
<td>Not determined</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.26</td>
<td>@ 20°C</td>
</tr>
<tr>
<td>Water Solubility</td>
<td>Miscible</td>
<td></td>
</tr>
<tr>
<td>Solubility in other solvents</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>-2.6</td>
<td>Calculated</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>400 °C / 752 °F</td>
<td></td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td></td>
<td>Not determined</td>
</tr>
<tr>
<td>Kinematic viscosity</td>
<td></td>
<td>Not determined</td>
</tr>
<tr>
<td>Dynamic viscosity</td>
<td>1300 mPa s</td>
<td>@ 20 °C</td>
</tr>
<tr>
<td>Explosive Properties</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>Oxidizing Properties</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

Other Information

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10. STABILITY AND REACTIVITY

Reactivity
Not reactive

Chemical stability
Stable under recommended storage conditions.

Possibility of Hazardous Reactions

- Hazardous Reactions: None under normal processing.
- Hazardous Polymerization: Hazardous polymerization does not occur.

Conditions to Avoid
Extremes of temperature and direct sunlight

Incompatible materials
Strong oxidizing agents.

Hazardous Decomposition Products
Acrolein may be formed if product is burned or strongly heated, especially in acidic conditions.

11. TOXICOLOGICAL INFORMATION

Information on likely routes of exposure

Product Information
Product does not present an acute toxicity hazard based on published data for similar substances.

- Inhalation: Inhalation of aerosol or mist may cause irritation of the respiratory tract.
- Eye contact: Not irritating to eyes.
- Skin contact: Not irritating to skin.
- Ingestion: Ingestion may cause stomach discomfort.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>LD50 Oral (Mouse), &gt;25,000 mg/kg (rat)</th>
<th>LD50 Dermal (Rabbit)</th>
<th>LC50 Inhalation (Rat) 1 h</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerin 56-81-5</td>
<td>&gt; 4,000 mg/kg</td>
<td>&gt; 18,700 mg/kg</td>
<td>&gt; 570 mg/m^3</td>
</tr>
</tbody>
</table>

Information on toxicological effects

Symptoms
No information available.

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

- Skin corrosion/irritation: Not irritating to skin.
- Serious eye damage/eye irritation: Not irritating to eyes.
- Sensitization: Not a skin sensitizer.
- Mutagenic Effects: Not classified as a mutagen by IARC.
- Carcinogenicity: This substance is not classified as a carcinogen by IARC, OSHA, ACGIH, or NTP.

Reproductive Toxicity
This product does not contain any known or suspected reproductive hazards.

- Developmental Toxicity: Not classified as a developmental toxin.
- Teratogenic: Not classified as a teratogen.
- STOT - single exposure: None under normal use conditions.
- STOT - repeated exposure: No known hazard.
- Aspiration hazard: No known hazard.

Numerical measures of toxicity-Product Information
Not determined
12. ECOLOGICAL INFORMATION

Ecotoxicity

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Toxicity to Algae</th>
<th>Toxicity to Fish</th>
<th>Microtox</th>
<th>Daphnia Magna (Water Flea)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerin 56-81-5</td>
<td>LC50 51 - 57 mL/L</td>
<td>Oncorhynchus mykiss 96 h</td>
<td>Pseudomonas putida (16 hr) &gt;10 g/l</td>
<td>EC50 &gt;10,000 mg/l 24 h Daphnia magna</td>
</tr>
</tbody>
</table>

Persistence and degradability
Readily biodegradable.

Bioaccumulation/Accumulation
Not expected to be bioaccumulative.

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

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerin 56-81-5</td>
<td>= -1.76</td>
</tr>
</tbody>
</table>

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste Disposal Method Dispose of in accordance with applicable regulations.

Contaminated Packaging Dispose of in accordance with applicable regulations.

14. TRANSPORT INFORMATION

DOT Not regulated
TDG Not regulated
MEX Not regulated
ICAO Not regulated
IATA Not regulated
IMDG / IMO Not regulated
RID Not regulated
ADR Not regulated
ADN Not regulated

15. REGULATORY INFORMATION

International Inventories

<table>
<thead>
<tr>
<th>Inventory</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSCA</td>
<td>Complies</td>
</tr>
<tr>
<td>DSL</td>
<td>Complies</td>
</tr>
<tr>
<td>NDSL</td>
<td>Complies</td>
</tr>
<tr>
<td>EINECS</td>
<td>Complies</td>
</tr>
<tr>
<td>ELINCS</td>
<td>Complies</td>
</tr>
<tr>
<td>ENCS</td>
<td>Complies</td>
</tr>
<tr>
<td>IECSC</td>
<td>Complies</td>
</tr>
<tr>
<td>KECL</td>
<td>Complies</td>
</tr>
</tbody>
</table>
PICCS Complies
AICS Complies

Legend
TSCA - United States Toxic Substances Control Act Section 8(b) Inventory
DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
ENCS - Japan Existing and New Chemical Substances
IECSG - China Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
AICS - Australian Inventory of Chemical Substances

U.S. Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

SARA 311/312 Hazard Categories
- Acute health hazard No
- Chronic Health Hazard No
- Fire hazard No
- Sudden release of pressure hazard No
- Reactive Hazard No

Clean Water Act
This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

CERCLA
This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material

U.S. State Regulations

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>New Jersey</th>
<th>Massachusetts</th>
<th>Pennsylvania</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerin 56-81-5</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health Hazard 0</th>
<th>Flammability 1</th>
<th>Instability 0</th>
<th>Physical and Chemical Hazards n/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>HMIS</td>
<td>Health Hazard 0</td>
<td>Flammability 1</td>
<td>Physical hazards 0</td>
<td>Personal Precautions B</td>
</tr>
</tbody>
</table>

Issuing Date 14-Apr-2015
Revision Date 14-Apr-2015
Revision Note
Reason for Revision Update to GHS format
Disclaimer
The information in this safety data sheet (SDS) is believed to be accurate and is given in good faith but no representation or warranty as to its completeness or accuracy is made. Suggestions for uses or applications are only opinions. Users are responsible for determining the suitability of these products for their own particular purpose. No representation or warranty, express or implied, is made with respect to information or products including without limitation warranties of merchantability or fitness for a particular purpose or non-infringement of any third party patent or other intellectual property rights including without limit copyright, trademark and designs. Any trademarks identified herein are trademarks of Vantage Oleochemicals, Inc.
End of MSDS