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

Product Name          Glycerol
Product Code(s)         0854
Recommended Use        For Further Manufacturing Use Only
                        Not for Human or Animal Drug Use

Company
AMRESCO, LLC
6681 Cochran Road
Solon, Ohio 44139

Emergency Telephone Number    Chemtrec 1-800-424-9300
Company Phone Number          1-800-448-4442
E-mail Address                info@amresco-inc.com

2. HAZARDS IDENTIFICATION

GHS - Classification

Classification          Skin Irritant 2 Eye Irritant 2
Signal Word             Warning

Hazard Statements       H315 - Causes skin irritation H319 - Causes serious eye irritation H335 - May cause respiratory irritation
Precautionary Statements P280 - Wear protective gloves/protective clothing/eye protection/face protection P302+ P352 - IF ON SKIN: Wash with plenty of soap and water P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
3. COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>EC No.</th>
<th>REACH Reg. No.</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>-</td>
<td>Not available</td>
<td>56-81-5</td>
<td>95-100</td>
<td></td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Eye Contact
Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.

Skin Contact
Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes.

Inhalation
Move to fresh air. If breathing becomes difficult, give oxygen.

Ingestion
Clean mouth with water and afterwards drink plenty of water.

Notes to Physician
Treat symptomatically.

5. FIRE-FIGHTING MEASURES

Flammable Properties
Not flammable.

Flash Point
160 °C / 320 °F

Suitable Extinguishing Media
Dry chemical, CO2, water spray or regular foam.

Hazardous Combustion Products
Carbon oxides.

Explosion Data
- Sensitivity to Mechanical Impact: Not sensitive.
- Sensitivity to Static Discharge: Not sensitive.

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
Avoid contact with skin, eyes and clothing. Use personal protective equipment. Ensure adequate ventilation.

Methods for Containment
Prevent further leakage or spillage if safe to do so.

Methods for Cleaning Up
Absorb on sand or vermiculite and place in closed containers for disposal. Pick up and transfer to properly labeled containers. Ventilate area and wash spill site after material pickup is complete.

7. HANDLING AND STORAGE

Handling
Handle in accordance with good industrial hygiene and safety practice. Hygroscopic.
Storage
Keep containers tightly closed in a dry, cool and well-ventilated place.
Hygroscopic.

Incompatible Products
Strong oxidizing agents. Strong bases.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>ACGIH TLV</th>
<th>OSHA PEL</th>
<th>NIOSH IDLH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol 56-81-5</td>
<td>TWA: 15 mg/m³</td>
<td>TWA: 5 mg/m³</td>
<td></td>
</tr>
</tbody>
</table>

Engineering Measures
Showers
Eyewash stations
Ventilation systems.

Personal Protective Equipment
Eye/Face Protection
Tightly fitting safety goggles.

Skin and Body Protection
Wear protective gloves/clothing.

Respiratory Protection
If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

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

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
Colorless, clear, haze-free

Odor
No information available

Odor Threshold
No information available

Decomposition Temperature °C
No information available

Freezing Point
No information available

Initial Boiling Point
No information available

Physical State
Material

pH
5.5 - 8

Flash Point
320 °F / 160 °C

Autoignition Temperature
698 °F / 369 °C

Boiling Point/Range
182 °C / 20 MM

Melting Point/Range
No data available 20

Flammability Limits in Air
Upper No data available
Lower No data available

Explosive Properties
No information available

Oxidizing Properties
No information available

Evaporation Rate
No data available

MMHG @ 37.8 C
No data available

Vapor Density
No data available

Specific Gravity
1.261

Density
3.1

Solubility
No information available

Partition Coefficient (n-octanol/water)
No data available

Viscosity
No information available

10. STABILITY AND REACTIVITY
Stability Stable under recommended storage conditions.

Incompatible Products Strong oxidizing agents. Strong bases.

Conditions to Avoid None known based on information supplied.

Hazardous Decomposition Products Carbon oxides.

Hazardous Polymerization Hazardous polymerization does not occur.

### 11. TOXICOLOGICAL INFORMATION

#### Acute Toxicity

**Product Information** Irritating to eye, skin and respiratory system.

#### Chronic Toxicity

**Chronic Toxicity** No known effect based on information supplied.

**Target Organ Effects** None known.

### 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>Glycerol</td>
<td>LC50 51 - 57 mL/L</td>
<td>Oncorhynchus mykiss 96 h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 13. DISPOSAL CONSIDERATIONS

**Waste Disposal Method** Dispose of material in accordance with all federal, state, and local regulations.

**Contaminated Packaging** Dispose of in accordance with all federal, state and local regulations.

### 14. TRANSPORT INFORMATION

**IATA** Not regulated

**DOT** Not regulated
## 15. REGULATORY INFORMATION

### REACH Title VII Restrictions
No information available.

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Dangerous Substances</th>
<th>Organic Solvents</th>
<th>Harmful Substances Whose Names Are to be Indicated on the Label</th>
<th>Pollution Release and Transfer Registry (Class II):</th>
<th>Pollution Release and Transfer Registry (Class I):</th>
<th>Poison and Deleterious Substances Control Law:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol 56-81-5</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### Component

<table>
<thead>
<tr>
<th>Glycerol 56-81-5 (95-100)</th>
<th>ISHA - Harmful Substances Prohibited for Manufacturing, Importing, Transferring, or Supplying</th>
<th>ISHA - Harmful Substances Requiring Permission</th>
<th>Toxic Chemical Classification Listing (TCCL) - Toxic Chemicals</th>
<th>Toxic Release Inventory (TRI) - Group I</th>
<th>Toxic Release Inventory (TRI) - Group II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

### International Inventories

- **TSCA**
  - Complies
- **EINECS/ELINCS**
  - Complies
- **ENCS**
  - Complies
- **IECSC**
  - Complies
- **KECL**
  - Does not Comply
- **PICCS**
  - Complies
- **AICS**
  - Complies

### 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

<table>
<thead>
<tr>
<th>Hazard Category</th>
<th>Yes/No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute Health Hazard</td>
<td>Yes</td>
</tr>
<tr>
<td>Chronic Health Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Fire Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Sudden Release of Pressure Hazard</td>
<td>No</td>
</tr>
<tr>
<td>Reactive Hazard</td>
<td>No</td>
</tr>
</tbody>
</table>

#### 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).

#### Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product contains the following substances which are listed hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act:

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS-No</th>
<th>Weight %</th>
<th>HAPS data</th>
<th>VOC Chemicals</th>
<th>Class 1 Ozone Depletors</th>
<th>Class 2 Ozone Depletors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>56-81-5</td>
<td>95-100</td>
<td>Group II</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CERCLA

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*Page 5/6*
U.S. State Regulations

California Proposition 65
This product does not contain any Proposition 65 chemicals.

U.S. State Right-to-Know Regulations

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Massachusetts</th>
<th>New Jersey</th>
<th>Pennsylvania</th>
<th>Illinois</th>
<th>Rhode Island</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

International Regulations

Mexico - Grade

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Carcinogen Status</th>
<th>Exposure Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td></td>
<td>Mexico: TWA 10 mg/m³</td>
</tr>
</tbody>
</table>

Canada

WHMIS Hazard Class
D2B  Toxic materials

16. OTHER INFORMATION

Issuing Date  02-Jun-2010
Revision Date  09-Apr-2013
Revision Note  No information available

Recommended Restrictions  No information available

Disclaimer
The information provided on this MSDS 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 guide for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as 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 material or in any process, unless specified in the text.

End of MSDS