Dow Chemical Canada ULC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

## 1. Product and Company Identification

### Product Name

OPTIM* Glycerine 99.7%, USP/EP

### COMPANY IDENTIFICATION

Dow Chemical Canada ULC
A Subsidiary of The Dow Chemical Company
4445 Marie-Victorin Blvd
Varennes, QC J3X 1T3
Canada

For MSDS updates and Product Information: 800-331-6451

Prepared By: Prepared for use in Canada by EH&S, Product Regulatory Management Department.

450-652-1029

Revision 2006.12.12

Print Date: 10/9/2009

Customer Information Number: 800-331-6451

**EMERGENCY TELEPHONE NUMBER**

24-Hour Emergency Contact: (989) 636-4400

Local Emergency Contact: 989-636-4400

## 2. Hazards Identification

### Emergency Overview

**Color:** Colorless

**Physical State:** Liquid

**Odor:** Odorless

**Hazards of product:**

No significant immediate hazards for emergency response are known.
Potential Health Effects

Eye Contact: May cause slight temporary eye irritation. Corneal injury is unlikely.

Skin Contact: Prolonged exposure not likely to cause significant skin irritation.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts. Prolonged/repeated exposure to damaged skin (as in burn patients) may result in absorption of toxic amounts.

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material or mist may cause respiratory irritation.

Ingestion: Very low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. In humans, effects have been reported on the following organs: Central nervous system. Observations in humans include: Altered blood sugar levels.

Effects of Repeated Exposure: Excessive exposure to glycerine may cause increased fat levels in blood. In animals, effects have been reported on the following organs: Gastrointestinal tract.

Reproductive Effects: Reproductive effects seen in female animals are believed to be due to altered nutritional states resulting from extremely high doses of glycerine given in the diet. Similar effects have been seen in animals fed synthetic diets.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS #</th>
<th>Amount W/W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>56-81-5</td>
<td>&gt;= 99.7 %</td>
</tr>
</tbody>
</table>

Amounts are presented as percentages by weight.

4. First-aid measures

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Skin Contact: Wash skin with plenty of water.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Notes to Physician: No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.
Unusual Fire and Explosion Hazards: Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

See Section 9 for related Physical Properties

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Recover spilled material if possible. Contain spilled material if possible. Absorb with materials such as: Sand. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: No special precautions required.

Storage

Store in a dry place. Avoid moisture.

Shelf life: Use within 24 Months

Storage temperature: 17 - 55 °C

8. Exposure Controls / Personal Protection

Exposure Limits

<table>
<thead>
<tr>
<th>Component</th>
<th>List</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glycerol</td>
<td>OEL (QUE)</td>
<td>TWA Mist.</td>
<td>10 mg/m3</td>
</tr>
<tr>
<td></td>
<td>CAD AB OEL</td>
<td>TWA Mist.</td>
<td>10 mg/m3</td>
</tr>
<tr>
<td></td>
<td>CAD BC OEL</td>
<td>TWA Mist.</td>
<td>10 mg/m3</td>
</tr>
<tr>
<td></td>
<td>CAD BC OEL</td>
<td>TWA Respirable</td>
<td>3 mg/m3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>mist</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAD ON OEL</td>
<td>TWA Mist.</td>
<td>10 mg/m3</td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA Mist.</td>
<td>10 mg/m3</td>
</tr>
</tbody>
</table>

Consult local authorities for recommended exposure limits.

Personal Protection

Eye/Face Protection: Use safety glasses.

Skin Protection: When prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, boots, apron, or full-body suit will depend on the task.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Neoprene. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl alcohol ("PVA"). Ethyl vinyl alcohol laminate ("EVAL"). NOTICE: The selection of a specific glove for a
particular application and duration of use in a workplace should also take into account all
relevant workplace factors such as, but not limited to: Other chemicals which may be handled,
physical requirements (cut/puncture protection, dexterity, thermal protection), potential body
reactions to glove materials, as well as the instructions/specifications provided by the glove
supplier.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guideline. For
most conditions, no respiratory protection should be needed; however, if material is heated or sprayed,
use an approved air-purifying respirator. The following should be effective types of air-purifying
respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands
before smoking or eating.

Engineering Controls
Ventilation: Provide general and/or local exhaust ventilation to control airborne levels below the
exposure guidelines.

9. Physical and Chemical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Color</td>
<td>Colorless</td>
</tr>
<tr>
<td>Odor</td>
<td>Odorless</td>
</tr>
<tr>
<td>Flash Point - Closed Cup</td>
<td>199 °C Pensky-Martens Closed Cup ASTM D 93</td>
</tr>
<tr>
<td>Flammable Limits in Air</td>
<td>Lower: 2.6 % (V) Literature Vapor</td>
</tr>
<tr>
<td></td>
<td>Upper: 11.3 % (V) Literature Vapor</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>1 atm 370 °C Literature</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>1 mmHg @ 20 °C Literature</td>
</tr>
<tr>
<td>Boiling Point (760 mmHg)</td>
<td>290 °C Literature</td>
</tr>
<tr>
<td>Vapor Density (air = 1)</td>
<td>3.1 @ 20 °C Literature</td>
</tr>
<tr>
<td>Specific Gravity (H2O = 1)</td>
<td>1.2607 Literature</td>
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<tr>
<td>Liquid Density</td>
<td>10.49 g/cm3 @ 25 °C Test method in development</td>
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<tr>
<td>Freezing Point</td>
<td>18 °C Literature</td>
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<tr>
<td>Melting Point</td>
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<tr>
<td>Solubility in Water (by weight)</td>
<td>100 % @ 20 °C Literature</td>
</tr>
<tr>
<td>pH</td>
<td>6.5 - 8.5 pH Electrode (50% aq. sol.)</td>
</tr>
<tr>
<td>Molecular Weight</td>
<td>92.1 g/mol Literature</td>
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<tr>
<td>Octanol/Water Partition Coefficient</td>
<td>-1.76 Measured</td>
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<tr>
<td>Dynamic Viscosity</td>
<td>945 mPs @ 25 °C Literature</td>
</tr>
<tr>
<td>Kinematic Viscosity</td>
<td>No test data available</td>
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</tbody>
</table>

10. Stability and Reactivity

Stability/Instability
Stable under recommended storage conditions. See Storage, Section 7. Hygroscopic.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Avoid
moisture.

Incompatible Materials: Avoid contact with: Strong oxidizers.

Hazardous Polymerization
Will not occur.

Thermal Decomposition
Decomposition products depend upon temperature, air supply and the presence of other materials.
Decomposition products can include and are not limited to: Acrolein.
11. Toxicological Information

Acute Toxicity
Ingestion
LD50, Rat  17,000 - 27,200 mg/kg
Skin Absorption
LD50, Rabbit > 10,000 mg/kg
Inhalation
LC50, 6 h, Aerosol, Rat > 4 mg/l

Repeated Dose Toxicity
Excessive exposure to glycerine may cause increased fat levels in blood. In animals, effects have been reported on the following organs: Gastrointestinal tract.

Chronic Toxicity and Carcinogenicity
For the major component(s): Did not cause cancer in laboratory animals.

Developmental Toxicity
Did not cause birth defects or any other fetal effects in laboratory animals.

Reproductive Toxicity
Reproductive effects seen in female animals are believed to be due to altered nutritional states resulting from extremely high doses of glycerine given in the diet. Similar effects have been seen in animals fed synthetic diets.

Genetic Toxicology
In vitro genetic toxicity studies were negative.

12. Ecological Information

CHEMICAL FATE

Movement & Partitioning
Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc between 0 and 50). Given its very low Henry’s constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.

Henry’s Law Constant (H): 1.73E-8 atm*m3/mole; 25 °C Measured
Partition coefficient, n-octanol/water (log Pow): -1.76 Measured
Partition coefficient, soil organic carbon/water (Koc): 1 Estimated

Persistence and Degradability
Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

OECD Biodegradation Tests:

<table>
<thead>
<tr>
<th>Biodegradation</th>
<th>Exposure Time</th>
<th>Method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>63 %</td>
<td>14 d</td>
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</table>

Biological oxygen demand (BOD):

<table>
<thead>
<tr>
<th>BOD 5</th>
<th>BOD 10</th>
<th>BOD 20</th>
<th>BOD 28</th>
</tr>
</thead>
<tbody>
<tr>
<td>68 %</td>
<td>74 %</td>
<td>74 %</td>
<td></td>
</tr>
</tbody>
</table>

Chemical Oxygen Demand: 1.15 mg/mg

ECOTOXICITY
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity
LC50, fathead minnow (Pimephales promelas), static, 96 h: 44,000 mg/l

Aquatic Invertebrate Acute Toxicity
LC50, water flea Daphnia magna, 24 h: > 10,000 mg/l
Toxicity to Micro-organisms
EC50, OECD 209 Test; activated sludge, respiration inhibition, 3 h: > 1,000 mg/l

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details. Any disposal practice must be in compliance with all local and national laws and regulations. Do not dump into any sewers, on the ground, or into any body of water.

14. Transport Information

TDG Small container
NOT REGULATED

TDG Large container
NOT REGULATED

IMDG
NOT REGULATED

ICAO/IATA
NOT REGULATED

15. Regulatory Information

US. Toxic Substances Control Act
All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

European Inventory of Existing Commercial Chemical Substances (EINECS)
The components of this product are on the EINECS inventory or are exempt from inventory requirements.

CEPA - Domestic Substances List (DSL)
All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Hazardous Products Act Information: CPR Compliance
This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

Hazardous Products Act Information: WHMIS Classification
This product is not a "Controlled Product" under WHMIS.
16. Other Information

Hazard Rating System

<table>
<thead>
<tr>
<th>NFPA</th>
<th>Health</th>
<th>Fire</th>
<th>Reactivity</th>
</tr>
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<tbody>
<tr>
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Recommended Uses and Restrictions

Revision
Identification Number: 50444 / 1002 / Issue Date 2006.12.12 / Version: 2.1
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

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<tr>
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<tbody>
<tr>
<td>W/W</td>
<td>Weight/Weight</td>
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<tr>
<td>OEL</td>
<td>Occupational Exposure Limit</td>
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<tr>
<td>STEL</td>
<td>Short Term Exposure Limit</td>
</tr>
<tr>
<td>TWA</td>
<td>Time Weighted Average</td>
</tr>
<tr>
<td>ACGIH</td>
<td>American Conference of Governmental Industrial Hygienists, Inc.</td>
</tr>
<tr>
<td>DOW IHG</td>
<td>Dow Industrial Hygiene Guideline</td>
</tr>
<tr>
<td>WEEL</td>
<td>Workplace Environmental Exposure Level</td>
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<tr>
<td>HAZ_DES</td>
<td>Hazard Designation</td>
</tr>
<tr>
<td>VOL/VOL</td>
<td>Volume/Volume</td>
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</table>

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