HAZARDS IDENTIFICATION

Inhalation: Based on physical state and properties is negligible unless heated to produce vapors. Vapors inhalation may cause coughing and respiratory system irritation. Prolonged inhalation may cause further lung damage.

Eye: Eye contact may cause irritation, redness, itching and inflammation.

Skin: Skin contact may cause moderate and local effect such as irritation and itching. Absorbing through skin and entry into the blood-stream may produce systemic injury with harmful effects on the other body's organs.

Ingestion: May cause mild symptoms like nausea, vomiting, diarrhea and loss of consciousness. Liver and Kidney damages are the severe effect of ingestion.

3. COMPOSITION

Chemical Name Wt.% CAS No.

Triethylene Glycol 100 112-27-6

4. FIRST AID MEASURES

Eyes: Wash out immediately with fresh and lukewarm running water for at least 20 minutes. Remove contact lenses, if presents and easy to do (otherwise removal should undertaken by skilled personal). If irritation persists after washing, get medical attention.

Skin: Flush the contaminated skin with soap and water. If chemical penetrates the clothing, remove them and flush the skin with water. If irritation persists after washing, get medical attention.

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Inhalation: Leave the contaminated place and breathe fresh air. If not breathing, apply artificial respiration. If symptoms persist call a medical center.

Ingestion: Seek medical attention immediately. If person is consciousness give 1 cup (240ml) of water (never feed to unconsciousness person). Do not induce vomiting!

5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media: Dry chemical powder, Carbon dioxide, Foam, Alcohol stable foam

General Information: Alert emergency center. Keep other containers away from fire place if this is

possible and safe. Keep your distance safe from fire. Wear protective clothes. Use water spray to control the fire.

Flash Point: 177 ℃ (350 ℉).

Lower Explosive Limit (LEL) : 0.9%

Upper Explosive Limit (UEL) : 9.2%

Auto Ignition Temperature: 370 ℃ (698 ℉).

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken in Case Material is Released or Spilled: small spills: Absorb with materials such as: Dirt, Sand, Sawdust, Vermiculite. Large spills: Dike area to contain spill. Pump into suitable and properly labeled containers.

Personal Precautions: Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater.

7. HANDLING AND STORAGE

Handling: Avoid contact with skin and clothing. Wash thoroughly after handling. Spills of these organic materials on hot fibrous insulations may lead to lowering of the auto ignition temperatures possibly resulting in spontaneous combustion.

Storage: Do not store near food, foodstuffs, drugs or potable water supplies.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator.

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Hand Protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. If hands are cut or scratched, use gloves chemically resistant to

this material even for brief exposures.

Eye/Face Protection: Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles.

Skin Protection: when prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material.

9. PHYSICAL AND CHEMICAL PROPERTIES

Triethylene Glycol

Form: liquid

Color: Colorless

Odor: mild

Density: 1.1274

Vapor Density: 5.17 (Air=1)

Viscosity @ 25 ℃ (cP): 49

Melting Point: -5 ℃(23 ℉)

Boiling Point: 285 ℃(545 ℉)

pH (1% soln/water): 8

Vapor Pressure: <0.01 mmHg @ 20℃

Solubility in water: soluble (easy in cold water)

Molecular Formula: C6H14O4

Molecular Weight: 150 g/mol

10. STABILITY AND REACTIVITY

General: stable under recommended storage condition in section 7.

Conditions to Avoid: Exposure to elevated temperatures can cause product to decompose. Generation the gas during decomposition can cause pressure in closed system.

Incompatible Material: Avoid contact with: strong acids, strong bases, strong oxidizers.

Hazardous Decomposition Products: Decomposition products depend upon temperature, air

supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes, Ketones, Organic Acids.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Ingestion

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LD50, Rat 16800-22060 mg/kg

Dermal

LD50, Rabbit > 18016 mg/kg

Inhalation

Maximum attainable concentration. LC50, 4h, Aerosol, Rat > 4.5 mg/l

Eye damage/eye irritation

May cause slight temporary eye irritation. Mist may cause eye irritation.

Skin corrosion/irritation

Prolonged contact may cause skin irritation with local redness. May cause more severe response if skin is scratched.

12. ECOLOGICAL INFORMATION

Ecotoxicity: Material is practically non-toxic to aquatic organisms on an acute basis. (LC50/EC50/EL50/LL50 > 100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, bluegill (Lepomis macrochirus), 96 h: 61000 mg/l

Aquatic Invertebrate Acute toxicity

EC50, water flea Daphnia magna, 48 h: 49000 mg/l

Toxicity to micro-organisms

EC50; bacteria, Growth inhibition (cell density reduction), 16 h: > 10000 mg/l

Aquatic Invertebrates Chronic Toxicity Value:

ChV Value mg/l Species Test Type Endpoint Exposure Time

10607 mg/l Water flea/

Daphnia Magna

Static renewal growth 21D

Environmental:

Movement and partitioning

Bioconcentration potential is low (BCF is less than 100 or log Pow less than 3). Potential for mobility in soil is very high (Koc is between 0 and 50).

Henry's Law Constant (H): 4.37E-10 atm*m3/mole; 25°C estimated.

Partition Coefficient, n-octanol/water (log Pow): -1.75 Estimated.

Partition Coefficient, soil organic carbon/water (Koc): 10 Estimated.

Persistence and Degradability

Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability). Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Indirect Photodegredation with OH Radicals

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Rate Constant Atmospheric Half-life Method

3.64E-11 cm/3/s 3.5 H Estimated

OECD Biodegradation Tests:

BIODEGREDATION Exposure Time Method

25-92% 28 D OECD 301C TEST

>70-95% 2-14 D OECD 302B TEST

Biological oxygen demand (BOD):

BOD 5 BOD 10 BOD 20 BOD 28

12-32% 15-64% 17-86%

Theoretical Oxygen Demand: 1.6 mg/mg

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. We have 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

14. TRANSPORT INFORMATION

DOT Classification: not a DOT controlled material.

Identification: not applicable.

Special Provisions for transport: not applicable.

15. Regulatory information

TSCA (Toxic Substance Control Act) Yes

Section 311/312 Hazard Class Immediate (acute) health hazard

WHMIS classification (Canada) Not restricted

Foreign Inventory Canadian DSL (Domestics Substances List)

EINECS (European Inventory of Existing

Commercial Chemical Substances)

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CEPA (Canadian Environmental Protection Act)

16. OTHER INFORMATION

The information above is believed to be accurate and represents the best information currently available to us.However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purpose.

Caution

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct since it was obtained from sources we believe are reliable. However no representation, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of

the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion.