

1. IDENTIFICATION

Product Name: Sour Glycol
SDS Number: 815862

Intended Use: Dehydration of sour natural gas

Manufacturer/Supplier: CENOVUS ENERGY INC.
 500 Centre Street SE, PO Box 766
 Calgary, AB T2P 0M5

Prepared By: Cenovus Energy Inc. Health and Safety

Phone Number: 1-403-766-2000

Emergency Telephone: Cenovus 1-877-458-8080
 CANUTEC 1-613-996-6666 (Canada)
 CHEMTREC 1-800-424-9300

2. HAZARDS IDENTIFICATION

Classification

H224 -- Flammable liquids -- Category 1
 H304 -- Aspiration Hazard -- Category 1
 H336 -- Specific target organ toxicity (single exposure) -- Category 3
 H340 -- Germ cell mutagenicity -- Category 1B
 H350 -- Carcinogenicity -- Category 1A
 H361F -- Reproductive toxicity -- Category 2
 H370 -- Specific target organ toxicity (single exposure) -- Category 1
 H372 -- Specific target organ toxicity (repeated exposure) -- Category 1
 H412 -- Hazardous to the aquatic environment, chronic toxicity -- Category 3

Hazards not Otherwise Classified

May contain or release poisonous hydrogen sulfide gas

Label Elements



DANGER

Extremely flammable liquid and vapor. (H224)*
May contain or release poisonous hydrogen sulfide gas
May be fatal if swallowed and enters airways. (H304)*
May cause drowsiness or dizziness. (H336)*
May cause genetic defects. (H340)* May cause cancer. (H350)*
Suspected of damaging fertility or the unborn child. (H361)*
Causes damage to organs (H370)*
Causes damage to organs through prolonged or repeated exposure. (H372)*
Harmful to aquatic life with long lasting effects. (H412)*

Precautionary Statement(s):

Obtain special instructions before use. (P201)*
 Do not handle until all safety precautions have been read and understood. (P202)*
 Keep away from heat/sparks/open flames/hot surfaces. - No smoking. (P210)*
 Keep container tightly closed. (P233)*
 In case of fire: Use dry chemical, carbon dioxide, or foam for extinction.(P370+P378)*

- Keep cool. (P235)*
- Ground/bond container and receiving equipment. (P240)*
- Use with explosion-proof equipment. (P241)*
- Use only non-sparking tools. (P242)*
- Take precautionary measures against static discharge. (P243)*
- Do not breathe dust/fume/gas/mist/vapours/spray. (P260)*
- Avoid contact during pregnancy and while nursing. (P263)*
- Wash thoroughly after handling. (P264)*
- Do not eat, drink or smoke when using this product. (P270)*
- Use only outdoors or in a well-ventilated area. (P271)*
- Avoid release to the environment. (P273)*
- Wear protective gloves / protective clothing / eye protection / face protection. (P280)*
- IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. (P361)*
- Rinse skin with water/shower. (P353)*
- IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician. (P301+P310)*
- Do NOT induce vomiting. (P331)*
- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. (P340)*
- IF exposed: Call a POISON CENTER or doctor/physician. (P311)*
- Store in a well-ventilated place. Keep container tightly closed. (P403+P233)*
- Store locked up. (P405)*
- Dispose of contents/container to approved disposal facility. (P501)*

* (Applicable GHS hazard code.)

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CASRN	Concentration ¹
Ethylene Glycol	107-21-1	95-100
n-Hexane	110-54-3	0.5-5
Benzene	71-43-2	0.1-1
Hydrogen Sulfide	7783-06-4	<0.01

¹ All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. FIRST AID MEASURES

Eye Contact: If irritation or redness develops from exposure, flush eyes with clean water. If symptoms persist, seek medical attention.

Skin Contact: Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water or a waterless hand cleaner. If irritation or redness develops and persists, seek medical attention.

Inhalation (Breathing): If respiratory symptoms or other symptoms of exposure develop, move victim away from source of exposure and into fresh air in a position comfortable for breathing. If symptoms persist, seek immediate medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion (Swallowing): Aspiration hazard: Do not induce vomiting or give anything by mouth because this material can enter the lungs and cause severe lung damage. If victim is drowsy or unconscious and vomiting, place on the left side with the head down. If possible, do not leave victim unattended and observe closely for adequacy of breathing. Seek medical attention.

Most important symptoms and effects

Acute: CNS depression, acidosis, and nephrotoxicity (oliguria/anuria).

Delayed: Adverse effects on kidney function.

Notes to Physician: At high concentrations hydrogen sulfide may produce pulmonary edema, respiratory depression, and/or respiratory paralysis. The first priority in treatment should be the establishment of adequate ventilation and the administration of 100% oxygen. Animal studies suggest that nitrites are a useful antidote, however, documentation of the efficacy of nitrites in humans is lacking. If the diagnosis of hydrogen sulfide poisoning is confirmed and if the patient does not respond rapidly to supportive care, the use of nitrites may be an effective antidote if delivered within the first few minutes of exposure. For adults the dose is 10 mL of a 3% NaNO₂ solution (0.5 gm NaNO₂ in 15 mL water) I.V. over 2-4 minutes. The dosage should be adjusted in children or in the presence of anemia, and methemoglobin levels, arterial blood gases, and electrolytes should be monitored closely.

Toxic metabolites of ethylene glycol may cause acidosis, coma, convulsions, renal failure, or circulatory collapse. The monitoring of urine output, serum creatinine, electrolytes, acid base balance, urine hemoglobin and serum calcium is recommended following significant exposures. Ethanol blocks the formation of glycolic acid and therefore is the antidote of choice. Because of the rapid conversion (3-hour elimination half-life) of the ethylene glycol, ethanol should be administered as soon as possible in cases of severe poisoning. If medical care will be delayed several hours, use 3-4 one-ounce oral (shots) of 86-proof whiskey before or during transport to the hospital.

Other Comments: Before attempting rescue, first responders should be alert to the possible presence of hydrogen sulfide, a poisonous gas with the smell of rotten eggs, and should consider the need for respiratory protection (see Section 8). Remove casualty to fresh air as quickly as possible. Immediately begin artificial respiration if breathing has ceased. Consider whether oxygen administration is needed. Obtain medical advice for further treatment.

5. FIRE FIGHTING MEASURES



EPA 704 Hazard Class

Health: 2 **Flammability:** 3 **Instability:** 0 (0-Minimal, 1-Slight, 2-Moderate, 3-Serious, 4-Severe)

Unusual Fire & Explosion Hazards: Extremely flammable. This material can be ignited by heat, sparks, flames, or other sources of ignition (e.g., static electricity, pilot lights, mechanical/electrical equipment, and electronic devices such as cell phones, computers, calculators, and pagers which have not been certified as intrinsically safe). Vapors may travel considerable distances to a source of ignition where they can ignite, flash back, or explode. May create vapor/air explosion hazard indoors, in confined spaces, outdoors, or in sewers. This product will float and can be reignited on surface water. Vapors are heavier than air and can accumulate in low areas. If container is not properly cooled, it can rupture in the heat of a fire. Hazardous combustion/decomposition products, including hydrogen sulfide, may be released by this material when exposed to heat or fire. Use caution and wear protective clothing, including respiratory protection.

Extinguishing Media: Dry chemical, carbon dioxide, or foam is recommended. Water spray is recommended to cool or protect exposed materials or structures. Carbon dioxide can displace oxygen. Use caution when applying carbon dioxide in confined spaces. Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam. Water may be ineffective for extinguishment, unless used under favorable conditions by experienced fire fighters.

Fire Fighting Instructions: For fires beyond the initial stage, emergency responders in the immediate hazard area should wear protective clothing. When the potential chemical hazard is unknown, in enclosed or confined spaces, a self contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8).

Isolate immediate hazard area and keep unauthorized personnel out. Stop spill/release if it can be done safely. Move undamaged containers from immediate hazard area if it can be done safely. Water spray may be useful in minimizing or dispersing vapors and to protect personnel. Cool equipment exposed to fire with water, if it can be done safely. Avoid spreading burning liquid with water used for cooling purposes.

Hazardous Combustion Products: Combustion may yield smoke, carbon monoxide, aldehydes and other products of incomplete combustion. Oxides of nitrogen and sulfur may also be formed.

See Section 9 for Flammable Properties including Flash Point and Flammable (Explosive) Limits

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Extremely flammable. Spillages of liquid product will create a fire hazard and may form an explosive atmosphere. Keep all sources of ignition and hot metal surfaces away from spill/release if safe to do so. The use of explosion-proof electrical equipment is recommended. May contain or release poisonous hydrogen sulfide gas. If the presence of dangerous amounts of H₂S around the spilled product is suspected, additional or special actions may be warranted, including access restrictions and use of protective equipment. Stay upwind and away from spill/release. Avoid direct contact with material. For large spillages, notify persons down wind of the spill/release, isolate immediate hazard area and keep unauthorized personnel out. Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8). See Sections 2 and 7 for additional information on hazards and precautionary measures.

Environmental Precautions: Stop spill/release if it can be done safely. Prevent spilled material from entering sewers, storm drains, other unauthorized drainage systems, and natural waterways. Use foam on spills to minimize vapors. Use water sparingly to minimize environmental contamination and reduce disposal requirements. If spill occurs on water notify appropriate authorities and advise shipping of any hazard. Spills into or upon navigable waters, the contiguous zone, or adjoining shorelines that cause a sheen or discoloration on the surface of the water, may require notification of the National Response Center (phone number 800-424-8802). If spill/release in excess of EPA reportable quantity (see Section 15) is made into the environment, immediately notify the National Response Center (phone number 800-424-8802).

Methods for Containment and Clean-Up: Notify relevant authorities in accordance with all applicable regulations. Immediate cleanup of any spill is recommended. Dike far ahead of spill for later recovery or disposal. Absorb spill with inert material such as sand or vermiculite, and place in suitable container for disposal. If spilled on water remove with appropriate methods (e.g. skimming, booms or absorbents). In case of soil contamination, remove contaminated soil for remediation or disposal, in accordance with local regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken. See Section 13 for information on appropriate disposal.

7. HANDLING AND STORAGE

Precautions for safe handling: Keep away from ignition sources such as heat/sparks/open flame – No smoking. Take precautionary measures against static discharge. Nonsparking tools should be used. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink, or smoke when using this product. May contain or release dangerous levels of hydrogen sulfide. Do not breathe vapors or mists. Wash thoroughly after handling. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Extremely Flammable. May vaporize easily at ambient temperatures. The vapor is heavier than air and may create an explosive mixture of vapor and air. Beware of accumulation in confined spaces and low lying areas. Open container slowly to relieve any pressure. Electrostatic charge may accumulate and create a hazardous condition when handling or processing this material. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. The use of explosion-proof electrical equipment is recommended and may be required (see appropriate fire codes). Refer to NFPA-70 and/or API RP 2003 for specific bonding/grounding requirements. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146. Do not wear contaminated clothing or shoes. Keep contaminated clothing away from sources of ignition such as sparks or open flames.

Conditions for safe storage: This material may contain or release poisonous hydrogen sulfide gas. In a tank, barge, or other closed container, the vapor space above this material may accumulate hazardous concentrations of hydrogen sulfide. Check atmosphere for oxygen content, H₂S, and flammability prior to entry. Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well-ventilated areas away from heat, direct sunlight, hot metal surfaces, and all sources of ignition. Store only in approved containers. Post area "No Smoking or Open Flame." Keep away from any incompatible material (see Section 10). Protect container(s) against physical damage. Outdoor or detached storage is preferred. Indoor storage should meet OSHA standards and appropriate fire codes.

"Empty" containers retain residue and may be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, or other sources of ignition. They may explode and cause injury or death. "Empty" drums should be completely drained, properly bunged, and promptly shipped to the supplier or a drum reconditioner. All containers should be disposed of in an environmentally safe manner and in accordance with governmental regulations. Before working on or in tanks which contain or have contained this material, refer to OSHA regulations, ANSI Z49.1, and other references pertaining to cleaning, repairing, welding, or other contemplated operations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Component	ACGIH	OSHA	Alberta
Ethylene Glycol	CEIL: 100 mg/m ³ Aerosol	---	100 mg/m ³ Ceiling
n-Hexane	TWA: 50 ppm Skin	TWA: 500 ppm TWA: 1800 mg/m ³	50 ppm TWA8
Benzene	STEL: 2.5 ppm TWA: 0.5 ppm Skin	Ceiling: 25 ppm STEL: 5 ppm TWA: 10 ppm TWA: 1 ppm	0.5 ppm TWA8 2.5 ppm STEL
Hydrogen Sulfide	STEL: 5 ppm TWA: 1 ppm	Ceiling: 20 ppm	TWA: 10 ppm 8hr Ceiling: 15 ppm

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

Engineering controls: If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits, additional engineering controls may be required.

Eye/Face Protection: The use of eye protection that meets or exceeds ANSI Z.87.1 is recommended to protect against potential eye contact, irritation, or injury. Depending on conditions of use, a face shield may be necessary.

Skin/Hand Protection: The use of gloves impervious to the specific material handled is advised to prevent skin contact. Users should check with manufacturers to confirm the breakthrough performance of their products. Suggested protective materials: Nitrile

Respiratory Protection: Where there is potential for airborne exposure above the exposure limit a NIOSH certified air purifying respirator equipped with organic vapor cartridges/canisters with R or P95 filters may be used.

A respiratory protection program that meets or is equivalent to OSHA 29 CFR 1910.134 and ANSI Z88.2 should be followed whenever workplace conditions warrant a respirator's use. Air purifying respirators provide limited protection and cannot be used in atmospheres that exceed the maximum use concentration (as directed by regulation or the manufacturer's instructions), in oxygen deficient (less than 19.5 percent oxygen) situations, or under conditions that are immediately dangerous to life and health (IDLH).

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm). Data represent typical values and are not intended to be specifications.

Appearance:	Tan to Brown
Physical Form:	Liquid
Odor:	Mild glycol; Rotten egg / sulfurous
Odor Threshold:	No data
pH:	Not applicable
Vapor Pressure:	0.05-525 @ 68°F / 20°C mm Hg
Vapor Density (air=1):	2-4
Initial Boiling Point/Range:	>100 °F / °C; (estimate)
Melting/Freezing Point:	No data
Solubility in Water:	90-100%
Partition Coefficient (n-octanol/water) (Kow):	No data
Specific Gravity (water=1):	1.0-1.1 @ 68°F / 20°C
Percent Volatile:	0% - 10%
Evaporation Rate (nBuAc=1):	No data
Flash Point:	< 20 °F / < -7 °C
Test Method:	Tag Closed Cup (TCC), ASTM D56 (estimate) Varies depending on composition
Lower Explosive Limits (vol % in air):	0.6
Upper Explosive Limits (vol % in air):	15.0
Auto-ignition Temperature:	500 °F / 260 °C

10. STABILITY AND REACTIVITY

Stability: Stable under normal ambient and anticipated conditions of use.

Conditions to Avoid: Avoid high temperatures and all sources of ignition. Prevent vapor accumulation.

Materials to Avoid (Incompatible Materials): Avoid contact with strong oxidizing agents and strong reducing agents.

Hazardous Decomposition Products: Not anticipated under normal conditions of use.

Hazardous Polymerization: Not known to occur.

11. TOXICOLOGICAL INFORMATION

Information on Toxicological Effects of Substance/Mixture

Acute Toxicity	Hazard	Additional Information	LC50/LD50 Data
Inhalation	Expected to have a low degree of toxicity by inhalation	May contain or release poisonous hydrogen sulfide gas - see Other Comments.	>2.5 mg/L (vapor, estimated)
Skin Absorption	Unlikely to be harmful		> 2 g/kg (estimated)
Ingestion (Swallowing)	Low degree of toxicity by ingestion		4.0 g/kg (estimated)

Aspiration Hazard: May be fatal if swallowed and enters airways.

Skin Corrosion/Irritation: Causes mild skin irritation. Repeated exposure may cause skin dryness or cracking.

Serious Eye Damage/Irritation: Causes mild eye irritation.

Signs and Symptoms: Effects of overexposure may include irritation of the digestive tract, irritation of the respiratory tract, coughing, nausea, vomiting, abdominal pain, irregular heartbeats (arrhythmias), pulmonary edema (accumulation of fluids in the lungs), visual disturbances, signs of nervous system depression (e.g., headache, drowsiness, dizziness, loss of coordination, disorientation and fatigue), convulsions and coma.

Skin Sensitization: No information available on the mixture, however none of the components have been classified for skin sensitization (or are below the concentration threshold for classification).

Respiratory Sensitization: No information available.

Specific Target Organ Toxicity (Single Exposure): Causes damage to organs. May cause drowsiness and dizziness.

Specific Target Organ Toxicity (Repeated Exposure): Causes damage to organs through prolonged or repeated exposure.

Carcinogenicity: May cause cancer.

Germ Cell Mutagenicity: May cause genetic defects.

Reproductive Toxicity: Suspected of damaging fertility.

Other Comments: This material may contain or liberate hydrogen sulfide, a poisonous gas with the smell of rotten eggs. The smell disappears rapidly because of olfactory fatigue so odor may not be a reliable indicator of exposure. Effects of overexposure include irritation of the eyes, nose, throat and respiratory tract, blurred vision, photophobia (sensitivity to light), and pulmonary edema (fluid accumulation in the lungs). Severe exposures can result in nausea, vomiting, muscle weakness or cramps, headache, disorientation and other signs of nervous system depression, irregular heartbeats, convulsions, respiratory failure, and death.

Information on Toxicological Effects of Components

Ethylene Glycol

Target Organs: Ingestion of ethylene glycol by humans results in kidney damage (renal epithelial damage and oxalate crystals in the tubules). Administration of ethylene glycol resulted in hepatocellular hyaline degeneration in male mice fed diets containing 12,500 or 25,000 ppm ethylene glycol and female mice fed diets containing 50,000 ppm ethylene glycol.

Reproductive Toxicity: Ethylene glycol induces developmental effects in rats and mice by all routes of exposure. Ethylene glycol is teratogenic, inducing primarily skeletal and external malformations in rodents, sometimes at doses less than those that are maternally toxic. In repeated-dose toxicity studies, there has been no evidence of adverse impact on reproductive organs; in specialized studies, including a three-generation study in rats and continuous-breeding protocols in mice, evidence of reproductive effects has been restricted to mice (but not rats or rabbits) exposed to doses considerably greater than those associated with developmental effects in this species or renal effects in rats. It is believed that developmental and teratogenic toxicity occurs in rodents only at doses that exceed saturation of glycolic acid metabolism. Based on human metabolism data, the National Toxicology Program Center for the Evaluation of Risks to Human Reproduction reviewed the ethylene glycol literature and concluded that there is negligible concern for reproductive or developmental toxicity in humans at typical exposure levels.

n-Hexane

Target Organs: Excessive exposure to n-hexane can result in peripheral neuropathies. The initial symptoms are symmetrical sensory numbness and paresthesias of distal portions of the extremities. Motor weakness is typically observed in muscles of the toes and fingers but may also involve muscles of the arms, thighs and forearms. The onset of these symptoms may be delayed for several months to a year after the beginning of exposure. The neurotoxic properties of n-hexane are potentiated by exposure to methyl ethyl ketone and methyl isobutyl ketone.

Reproductive Toxicity: Prolonged exposure to high concentrations of n-hexane (>1,000 ppm) resulted in decreased sperm count and degenerative changes in the testes of rats but not those of mice.

Benzene

Carcinogenicity: Benzene is an animal carcinogen and is known to produce acute myelogenous leukemia (a form of cancer) in humans. Benzene has been identified as a human carcinogen by IARC, the US National Toxicology Program and the US- Occupational Safety and Health Administration.

Target Organs: Prolonged or repeated exposures to benzene vapors can cause damage to the blood and blood forming organs, including disorders like leukopenia, thrombocytopenia, and aplastic anemia.

Reproductive Toxicity: Some studies in occupationally exposed women have suggested benzene exposure increased risk of miscarriage and stillbirth and decreased birth weight and gestational age. The size of the effects detected in these studies was small, and ascertainment of exposure and outcome in some cases relied on self-reports, which may limit the reliability of these results.

Germ Cell Mutagenicity: Benzene exposure has resulted in chromosomal aberrations in human lymphocytes and animal bone marrow cells. Exposure has also been associated with chromosomal aberrations in sperm cells in human and animal studies.

12. ECOLOGICAL INFORMATION

Toxicity: The acute toxicity in aquatic organisms is expected to be between 10 and 100 mg/L, based on component data. The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

This material, if discarded as produced, would not be a federally regulated RCRA "listed" hazardous waste. However, it would likely be identified as a federally regulated RCRA hazardous waste for the following characteristic(s) shown below. See Sections 7 and 8 for information on handling, storage and personal protection and Section 9 for physical/chemical properties. It is possible that the material as produced contains constituents which are not required to be listed in the MSDS but could affect the hazardous waste determination. Additionally, use which results in chemical or physical change of this material could subject it to regulation as a hazardous waste.

Container contents should be completely used and containers should be emptied prior to discard. Container residues and rinseates could be considered to be hazardous wastes.

EPA Waste Number(s)

- D001 - Ignitability characteristic
- D018 - Toxicity characteristic (Benzene)

a. This material should be regarded as harmful to aquatic organisms, with the potential to cause long term adverse effects in the aquatic environment. Classification: H412; Chronic Cat 3

Other Adverse Effects: None anticipated.

13. DISPOSAL CONSIDERATIONS

The generator of a waste is always responsible for making proper hazardous waste determinations and needs to consider state and local requirements in addition to federal regulations.

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- D018 - Toxicity characteristic (Benzene)

14. TRANSPORT INFORMATION

Canadian (TDG)

Shipping Description: *The following shipping description assumes flash point and boiling point are within the ranges specified in Section 9.*
UN1993, Flammable liquids, n.o.s., (n-Hexane; ; Benzene), 3, II

Small Means of Containment

Package Marking: Flammable liquids, n.o.s., (n-Hexane, Benzene), UN1993

Package Labeling: Class 3, Flammable liquids

Large Means of Containment

Package Placard/Marking: Flammable / 1993

ERAP Index: None

Emergency Response Guide: 128

U.S. Department of Transportation (DOT)

Shipping Description: UN1993, Flammable liquids, n.o.s., (n-Hexane; ; Benzene), 3, II, RQ *

Non-Bulk Package Marking: Flammable liquids, n.o.s., (n-Hexane, Benzene), UN1993

Non-Bulk Package Labeling: Flammable liquid
Bulk Package/Placard Marking: Flammable / 1993
Packaging - References: 49 CFR 173.150; 173.202; 173.242
(Exceptions; Non-bulk; Bulk)
Hazardous Substance: See Section 15 for RQ` s
Emergency Response Guide: 128
Note:

- **Enter ", RQ (hazardous substance/s)", if the hazardous substance/s is/are not part of the shipping name if the amount/s in a single packaging equals or exceeds the reportable quantity/ies shown in Section 15.**
- **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable**

International Maritime Dangerous Goods (IMDG)

Shipping Description: UN1993, Flammable liquids, n.o.s., (n-Hexane , Benzene), 3, II, (FP° C cc), [where FP is the material's flash point in degrees Celsius closed cup]
Non-Bulk Package Marking: Flammable liquids, n.o.s., (n-Hexane, Benzene), UN1993
Labels: Flammable liquid
Placards/Marking (Bulk): Flammable / 1993
Packaging - Non-Bulk: P001
EMS: F-E, S-E
Note: **U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 25.**

International Civil Aviation Org. / International Air Transport Assoc. (ICAO/IATA)

UN/ID #: UN1993
Proper Shipping Name: Flammable liquids, n.o.s. (n-Hexane, Benzene)
Hazard Class/Division: 3
Packing Group: II
Non-Bulk Package Marking: Flammable liquids, n.o.s. (n-Hexane, Benzene), UN1993
Labels: Flammable liquid
ERG Code: 3H
Note: **U.S. DOT compliance requirements may apply. See 49 CFR 171.22, 23 & 24.**

	LTD. QTY	Passenger Aircraft	Cargo Aircraft Only
Packaging Instruction #:	Y341	353	364
Max. Net Qty. Per Package:	1 L	5 L	60 L

15. REGULATORY INFORMATION

CERCLA/SARA - Section 302 Extremely Hazardous Substances and TPOs (in pounds):

This material contains the following chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372:

Component	TPO	EPCRA RQ
Hydrogen Sulfide	500 lb	100 lb

CERCLA/SARA - Section 311/312 (Title III Hazard Categories)

Acute Health: No
 Chronic Health: Yes
 Fire Hazard: Yes
 Pressure Hazard: No
 Reactive Hazard: No

CERCLA/SARA - Section 313 and 40 CFR 372:

This material contains the following chemicals subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR 372:

Component	Concentration ¹	de minimis
Ethylene Glycol	95-100	1.0%
n-Hexane	0.5-5	1.0%
Benzene	0.1-1	0.1%

EPA (CERCLA) Reportable Quantity (in pounds):

This material contains the following chemicals subject to the reporting requirements of 40 CFR 302.4:

Component	RQ
Ethylene Glycol	5000 lb
n-Hexane	5000 lb
Benzene	10 lb
Hydrogen Sulfide	100 lb

California Proposition 65:

Warning: This material may contain detectable quantities of the following chemicals, known to the State of California to cause cancer, birth defects or other reproductive harm, and which may be subject to the warning requirements of California Proposition 65 (CA Health & Safety Code Section 25249.5):

Component	Type of Toxicity
Benzene	Cancer Developmental Toxicant Male Reproductive Toxicant

International Hazard Classification

Canada:

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

WHMIS Hazard Class:

B2 -Flammable Liquids
 D1B
 D2A
 D2B

National Chemical Inventories

All components are either listed on the US TSCA Inventory, or are not regulated under TSCA All components are either on the DSL, or are exempt from DSL listing requirements

U.S. Export Control Classification Number: EAR99

16. OTHER INFORMATION

Date of Issue: May 15, 2017
Status: FINAL
Previous Issue Date: April 3, 2012; February 9, 2012

Guide to Abbreviations:

ACGIH = American Conference of Governmental Industrial Hygienists; CASRN = Chemical Abstracts Service Registry Number; CEILING = Ceiling Limit (15 minutes); CERCLA = The Comprehensive Environmental Response, Compensation, and Liability Act; EPA = Environmental Protection Agency; GHS = Globally Harmonized System; IARC = International Agency for Research on Cancer; INSHT = National Institute for Health and Safety at Work; IOPC = International Oil Pollution Compensation; LEL = Lower Explosive Limit; NE = Not Established; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit (OSHA); SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit (15 minutes); TLV = Threshold Limit Value (ACGIH); TWA = Time Weighted Average (8 hours); UEL = Upper Explosive Limit; WHMIS = Worker Hazardous Materials Information System (Canada)