



## Material Safety Data Sheet Propane (Odorized)

### 1. Product Information

<b>Material Identifier:</b>	Propane, LPG, HD-5 Propane, Stenched propane, Odorized propane, Commercial Propane
<b>Manufacturer:</b>	Spectra Energy Transmission
<b>Emergency Tel:</b>	1-800-663-9931
<b>Fax Number:</b>	250-262-3638
<b>Address:</b>	Spectra Energy Transmission Mile 53 Alaska Hwy. PO Bag 6180 Fort St. John, BC V1J 4H7
<b>Material Use:</b>	Commonly used as fuel for heating, cooking, automobiles, forklift trucks, crop drying, welding, and cutting operations. Propane is also used in industry as a refrigerant, solvent, and a chemical feedstock.
<b>Chemical Identity:</b>	Mainly C3 hydrocarbons
<b>Synonyms/Trade Names:</b>	LPG (Liquefied Petroleum Gas), LP-Gas
<b>Other Emergency Tel:</b>	CANUTEC (613) 996-6666, CHEMTREC, U.S.: (800) 424-9300 International: (703) 527-3887

### 2. Hazardous Ingredients

INGREDIENTS	APPROXIMATE CONCENTRATION	CAS NUMBER	EXPOSURE LIMITS
Propane	90-99 %	74-98-6	March 2004 WCB of BC Exposure Limit TWA 2500 ppm (Critical Effect :Asphyxiation)
Propylene	0-5 %	115-07-1	Simple Asphyxiant
Ethane	0-5 %	74-84-0	Simple Asphyxiant
Butane and heavier hydrocarbons	0-2.5 %	106-97-8	March 2004 WCB of BC Exposure Limit for butane TWA 600 ppm, STEL 750 ppm (Critical Effect :Narcosis)
Ethyl Mercaptan (odorant)	0.5 ppm	75-08-1	March 2004 WCB of BC Exposure Limit TWA 0.5 ppm (Critical Effect :Irritation)

### 3. Regulatory Classification

<b>WHMIS:</b>	Class A- Compressed Gas Class B, Division 1 – Flammable Gas
<b>TDG: Shipping Name</b>	LIQUEFIED PETROLEUM GASES, or PETROLEUM GASES, LIQUEFIED UN 1075 Class 2.1
<b>NFPA Hazard Ratings:</b>	Health            1- Slightly hazardous to health Flammability    4 - Very flammable gas Reactivity        0 - Normally stable

### 4. Health Hazard Information

<b>Inhalation:</b>	May cause central nervous system disorder (e.g. loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Breathing high vapour concentrations for a few minutes may be fatal. Saturated vapours may be found in confined spaces or areas with poor ventilation. May cause irritation, breathing failure, coma and death. Inhalation exposure to this product at extremely high concentrations, as in accidental releases in which concentrations reach or exceed the flammable range, may result in cardiac arrhythmias. This material acts as a simple asphyxiant by displacing oxygen. Asphyxiation symptoms include rapid respiration, nausea, disorientation, unconsciousness, coma, and death. Ensure oxygen content is sufficient. Oxygen content of air should be greater than 19.5% or 148 pO <sub>2</sub> mmHg.
<b>Eye Contact:</b>	Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite (cold burns) and permanent eye damage.
<b>Skin Contact:</b>	Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite (cold burns).
<b>Ingestion:</b>	Material cannot usually be swallowed due to its physical state as a gas.

### 5. Physical Data

<b>Physical State:</b>	Gas
<b>Odour:</b>	Stenched with ethyl mercaptan to give product an odour similar to boiling cabbage or rotten eggs.
<b>Appearance:</b>	Colourless
<b>Vapour density (Air =1):</b>	0.51 @ 15 degrees C
<b>Boiling Point ( C ):</b>	-42 deg Celsius @ 1 atm

<b>Evaporation Rate:</b>	>1 (Rapid, gas at normal ambient conditions)
<b>Solubility in Water:</b>	Slight, 6.1% by volume @17.8 C
<b>Mol. Wt.</b>	44.1
<b>Specific Gravity (Water=1):</b>	0.51 (water =1)
<b>Odour Threshold:</b>	Not available
<b>Vapour Pressure:</b>	Very high
<b>pH:</b>	Not applicable
<b>Coefficient Water/Oil Distribution:</b>	Not applicable

## 6. Fire and Explosion Data

<b>Flashpoint:</b>	-103 deg C Closed Cup
<b>Lower Flammable (Explosive) Limit:</b>	2.4 %
<b>Upper Flammable (Explosive) Limit:</b>	9.5 %
<b>Auto-ignition Temperature:</b>	432 C
<b>Flammability Classification:</b>	Extremely flammable gas. Readily forms explosive mixtures in air.
<b>Combustion Products:</b>	Smoke, carbon monoxide, and carbon dioxide
<b>Sensitivity to Mechanical Impact:</b>	Stable material
<b>Sensitivity to Static Charge:</b>	Can be ignited readily by an electrostatic charge of sufficient energy.
<b>Extinguishing Media:</b>	Dry chemical powder, carbon dioxide, water spray or fog.
<b>Special Procedures:</b>	Heat from a fire can cause a rapid build-up of pressure inside cylinders, which may cause explosive rupture. Use water spray to cool exposed cylinders or tanks. Do not extinguish a fire unless the flow of gas can be stopped. If a leak or spill has not ignited, use water spray to disperse the vapours. Extinguish small residual fires with dry chemical powder or water spray. Try to cover liquid spills with foam. Evacuate area and fight fire from a safe distance or protected location. Use full protective equipment and SCBA. Use gas detectors in confined spaces.

## 7. Exposure Controls / Personal Protection

<b>General Considerations:</b>	Exposure to this material can be controlled in many ways. The measures appropriate for a particular worksite depend on how this material is used and on the extent of exposure.
<b>Exposure Control:</b>	Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits. Use explosion proof ventilation equipment.
<b>Respiratory Protection:</b>	<p>Where concentrations in air may exceed the occupational limits and where engineering, work practices or other means of exposure reduction are not adequate, approved respirators may be necessary to prevent over exposure by inhalation. The NIOSH recommendations for propane are applicable: Up to 2100 ppm- Supplied Air Respirator, or full face-piece Self Contained Breathing Apparatus</p> <p><b>EMERGENCY OR PLANNED ENTRY INTO UNKNOWN OR IDLH CONCENTRATIONS:</b></p> <p>Positive pressure, full face-piece SCBA; or positive pressure full face-piece SAR with an auxiliary positive pressure SCBA. Note: IDLH for propane is 2100 ppm (10% LEL)</p>
<b>Skin, Eye/Face Protection:</b>	Where skin and eye contact is unlikely, but may occur because of short and/or periodic exposures, wear long sleeves, chemical resistant gloves, gas proof goggles, and a face shield.

## 8. Accidental Release Measures

<b>Accidental Release Measures:</b>	Eliminate all sources of ignition in vicinity of released gas. Stop the source of the leak or release if possible to do so safely. Keep the public away. Notify the appropriate authorities immediately. Warn occupants of downwind areas. Disperse vapours with hose streams using fog nozzles. Monitor low areas, as propane is heavier than air and can settle into low areas. Prevent vapour and / or liquid from entering into sewers, basements or confined spaces.
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## 9. Handling and Storage

**Handling / Storage:** Keep containers closed. Handle and open containers with care. Store in a cool, well ventilated place away from incompatible materials. Store and load the container at normal (up to 38 deg C) temperature and at atmospheric pressure. Material will accumulate static charges which may cause a spark. Static charge build-up could become an ignition source. Use proper grounding procedures. Empty containers may contain product residue. Do not pressurize, cut, heat, or weld empty containers. Do not reuse empty containers without commercial cleaning or reconditioning.

## 10. Reactivity Data

<b>Hazardous Decomposition Products:</b>	None
<b>Hazardous Polymerization:</b>	Does not occur
<b>Stability:</b>	This material is stable.
<b>Incompatible with:</b>	Strong oxidizing agents (e.g. peroxides, chlorates, nitrates.)
<b>Conditions to Avoid:</b>	Static discharge, sparks, open flames and other ignition sources.
<b>Corrosivity to Metals:</b>	Not corrosive.

## 11. First Aid Measures

<b>Inhalation:</b>	This product is flammable. Take proper precautions to ensure your own safety before attempting rescue. Remove victim to fresh air. Commence CPR if breathing has stopped and summon medical attention immediately. Oxygen may be beneficial if administered by a person trained in its use.
<b>Eye:</b>	LIQUID: Quickly remove victim from source of contamination. Immediately and briefly flush with lukewarm, gently flowing water until the chemical is removed. Do not attempt to re-warm. Cover both eyes with a sterile dressing. DO NOT allow the victim to drink alcohol or smoke. Quickly transport victim to an emergency care facility. GAS: Not applicable
<b>Skin Contact:</b>	LIQUID: Quickly remove victim from source of contamination. Immediately and briefly, flush with lukewarm, gently flowing water until the chemical is removed. Do not attempt to re-warm the affected area on site. DO NOT rub or apply dry heat. Gently remove clothing or jewellery that may restrict circulation. Loosely cover the affected area with a sterile dressing. DO NOT allow victim to drink alcohol or smoke. Quickly

transport victim to an emergency care facility. GAS: Not Applicable, no effects expected.

**Ingestion:** Not applicable route of exposure for gases.

## 12. Toxicological Information

Propane is a simple asphyxiant. High concentrations of propane can displace oxygen and cause asphyxiation. Oxygen content in the atmosphere must not be allowed to fall below 18%. Effects of oxygen deficiency are as follows.

12-16% breathing and pulse rate increased, muscular coordination slightly disturbed;  
 10-14% emotional upset, abnormal fatigue, disturbed respiration;  
 6-10% nausea and vomiting. Collapse or loss of consciousness;  
 below 6% convulsive movements, possible respiratory collapse and death.

No long term effects have been reported from exposure to propane.

No data showing carcinogenic, teratogenic, embryotoxic, reproductive, or mutagenic effects.

## 13. MSDS Preparation

**Prepared by:** EHS Services  
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**Date Issued:** December 31, 2006

**Information Sources:** Canadian Centre for Occupational Health and Safety Cheminfo, industry publications, and material analysis.

**Additional Information:** NIOSH – National Institute for Occupational safety and Health  
 WHMIS – Workplace Hazardous Materials Information System  
 TDG – Transportation of Dangerous Goods  
 NFPA – National Fire Protection Association  
 IDLH – Immediately Dangerous to Life and Health  
 SCBA - Self Contained Breathing Apparatus  
 SABA - Supplied Air Breathing Apparatus

**DISCLAIMER ...** The information presented in this Material Safety Data Sheet is based on tests, research and reports from the above mentioned sources, which are believed to be accurate and reliable. The data and information are presented without warranty, guarantee or liability on the part of the preparer in good faith.