


1. IDENTIFICATION

Product Identifier	PROPANE
Synonyms	C3, Odourized Propane, Liquefied Petroleum Gas (LPG)
Chemical Description	Aliphatic, paraffinic hydrocarbon gas comprising predominantly of propane.
Product Use	Process stream, sales
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

Hazard Classifications	Flammable Gases – Category 1 Gas under Pressure - Liquefied Gas Simple Asphyxiant – Category 1
Label Elements	
Emergency Overview	Danger Extremely flammable gas Contains gas under pressure; may explode if heated May displace oxygen and cause rapid suffocation
Prevention	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No Smoking. Monitor to ensure adequate oxygen levels when working with product
Response	Leaking gas fire: Do not extinguish, unless leak can be stopped safely. In case of leakage, eliminate all ignition sources.
Storage	Protect from sunlight. Store in a well-ventilated place.
Disposal	Dispose of container in accordance with local, regional, national, and international regulations.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Ingredients	CAS Number	Approximate Concentration (%)
Propane	74-98-6	>85
Butane	106-97-8	<15

4. FIRST AID MEASURES

Inhalation	Remove to fresh air. Give oxygen, artificial respiration, or CPR if needed. Keep the person warm and at rest. Seek medical attention.
Eye Contact	Flush with large amounts of water for 15 minutes, lifting upper and lower lids at intervals. Do not use hot water for eye flushing. Seek medical attention.
Skin Contact	If liquid propane gets on clothing, remove clothing immediately and gently bathe affected area in water. Do not use hot water for skin flushing. Do not rub. Get medical attention.
Ingestion	Not a significant route of exposure.
Most Important Symptoms	Induces unconsciousness at high concentrations. Reduces available oxygen at high concentrations.

5. FIRE FIGHTING MEASURES

General Fire Hazards	See Section 9 for Flammability Properties. Gases may be ignited rapidly when exposed to heat, spark, open flame or other source of ignition. When mixed with air and exposed to an ignition source, flammable gases can burn in the open or explode in confined spaces. Being heavier than air, vapors may travel long distances to an ignition source and flash back. Runoff to sewer may cause fire or explosion hazard.
Hazardous Combustion Products	Products of incomplete combustion, Carbon monoxide
Extinguishing Media	Foam, CO2, dry chemical. Explosive accumulations can build up in areas of poor ventilation.
Firefighting Equipment/Instructions	Use water spray to cool fire-exposed containers, and to disperse gas if leak has not ignited. If safe to do so, cut off fuel and allow flame to burn out.

6. ACCIDENTAL RELEASE MEASURES

Notification Procedures	In the event of a spill or accidental release, notify relevant authorities in accordance with applicable regulations.
Personal precautions and Protective Equipment	Use only in well ventilated areas. Mechanical ventilation recommended in confined areas. Equipment must be explosion proof. Use positive pressure self-contained breathing apparatus or supplied air breathing apparatus when entering areas where high concentrations may be present. Insulated gloves, Splash goggles and face shield if SCBA or SABA not worn.
Environmental precautions	Prevent material from entering soil, waterways, drains, sewers, or confined areas.
Cleanup measures	If safe to do so, stop gas flow. Remove all ignition sources. Provide clearing ventilation if possible. Prevent from entering confined spaces. Use personal protective equipment.

7. HANDLING AND STORAGE

Handling	Avoid contact with liquid or liquid cooled equipment. Avoid inhalation. Bond and ground all transfers. Avoid sparking conditions.
Storage	Store in a cool, dry, well ventilated area away from heat, strong sunlight, and ignition sources.
Caution	High concentrations of propane may displace oxygen.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits
(8-hour TWA unless otherwise noted)

Hazardous Ingredients	Alberta	Saskatchewan	OSHA PEL	ACGIH TLV
Butane	1,000 ppm	1,000 ppm as Aliphatic hydrocarbon gases C1-C4	800 ppm	1,000 ppm as Aliphatic hydrocarbon gases C1-C4
Propane	1,000ppm	1,000 ppm as Aliphatic hydrocarbon gases C1-C4	1,000 ppm	1,000 ppm as Aliphatic hydrocarbon gases C1-C4

Engineering Controls Use only in well ventilated areas. Mechanical ventilation recommended in confined areas. Equipment must be explosion proof.

Hygiene Measures Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Avoid repeated and/or prolonged skin exposure. Wash hands with soap and water before eating, drinking, smoking, or using toilet facilities. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

Respirator Use positive pressure self-contained breathing apparatus or supplied air breathing apparatus when entering areas where high concentrations may be present.

Gloves Insulated gloves

PPE Eyewear Splash goggles and face shield if SCBA or SABA not worn.

Footwear As per safety policy.

Clothing As per fire protection policy.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquefied Gas	Appearance:	Colourless
Odour:	Odourless (may have mercaptan odour)	Odour Threshold (ppm):	Not Available
Specific Gravity @ 25°C:	0.51	pH:	Not Available
Vapour Pressure (mmHg, 38°C):	gaseous	RVP (kPa):	39
Vapour Density (air=1):	1.5	Evaporation Rate:	Not Available
Boiling Range (°C, D-7169):	-42 - 400+	Initial Boiling Pt. (°C, D-86):	-42
Flash Point (°C) & Method:	-104	Freezing Pt. (°C):	-188
Upper Explosive Limit (% v/v):	9.5 (estimated)	Lower Explosive Limit (% v/v):	2 (estimated)
Auto-Ignition Temp. (°C):	450 (estimated)	Sensitivity to Static Discharge:	Yes, may ignite
Sensitivity to Impact:	No	Solubility in Water	Negligible
Octanol/Water Coefficient:	2.36 (estimated)		

10. STABILITY AND REACTIVITY

Chemical Stability	Yes
Hazardous Reactions	Yes
Conditions to Avoid	Heat, strong sunlight, sources of ignition
Incompatibility	Chlorine and other strong oxidizing agents liquid propane will attack some plastic, rubber, and coatings
Hazardous Decomposition Products	Carbon monoxide, carbon dioxide
Synergistic Materials/Products	None reported

11. TOXICOLOGICAL INFORMATION

Acute Exposure Inhalation can cause headache, disorientation, dizziness, drowsiness and possibly unconsciousness. Evidence exists that propane can cause these effects at concentrations below those required for oxygen deficiency, for example 10% LEL and above. As concentration increases, oxygen deficiency and asphyxiation may occur. Rapidly expanding gas or vaporized liquid may cause frostbite to skin and eyes.

Hazardous Ingredients	Result	Species	Dose	Exposure
Butane	LC50	Rat	>10,000 ppm	4 hours
Propane	LD50 Oral	Rat	1,620 mg/kg	-
	LD50 Dermal	Rabbit	>8,260 mg/kg	-
	LC50	Rat	14,000 ppm	4 hours
		Rat	>800,000 ppm	15 minutes

Chronic Exposure N. Av.

Health Effects Irritant: N.Av.

Reproductive Toxicity: No

Skin Sensitization: No
Respiratory Sensitization: No
Carcinogenicity: No
Teratogenicity: No
Mutagenicity: No

Carcinogenicity Not classified as a carcinogen

12. ECOLOGICAL INFORMATION

Ecotoxicity	Not available
Biodegradation	May occur in water and soil, but volatilization is the dominant process.
Bioaccumulation	Has the potential to bioaccumulate.
Atmospheric Oxidation	Propane is oxidized in the atmosphere following reactions with hydroxyl radicals and chlorine atoms. Oxidation products include carbonyl compounds – acetone, acetaldehyde and propionaldehyde, etc.
Photolysis	Unlikely to undergo hydrolysis or direct photolysis in the environment.
Mobility	Medium mobility in soil; In water, propane may partition from the water column to organic matter contained in sediments and suspended materials.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

14. TRANSPORT INFORMATION

Regulatory Information	UN Number	Proper Shipping Name	Class	PG	Label	Additional Information
TDG	1978	PROPANE	2.1	-	PROPANE	
DOT	1978	PROPANE	2.1	-	PROPANE	
IMDG	1978	PROPANE	2.1	-	PROPANE	
ICAO/IATA	1978	PROPANE	2.1	-	PROPANE	

North American Emergency Response Guide Number: 115

Emergency Response Assistance Plan (Rail) Number: Not Applicable

15. REGULATORY INFORMATION

Canadian Classification	<p>This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulation (HPR) and the SDS contains all of the information required by the HPR.</p> <p>WHMIS 1988 Classification: A, B1</p> <p>CEPA Domestic Substance List: All components are either listed or exempt.</p>
US Federal and State Regulations	<p>The contents of this SDS comply with the OSHA Hazard Communication Standard 29 CFR 1910.1200.</p> <p>NFPA 704 Rating: Flammability:4, Instability/Reactivity:0, Health:2</p>

16. OTHER INFORMATION

Guide to Abbreviations: 15min = 15 minutes; ACGIH = American Conference of Governmental Hygienists; C = Ceiling; CAS = Chemical Abstracts Service Registry; CEPA = Canadian Environmental Protection Act; CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act cSt = centistokes; DOT = Department of Transport; EmS = Environmental Management System; ERG = Emergency Response Guide IARC = International Agency for Research on Cancer; ICAO/IATA = International Civil Aviation Organization/International Air Transport Association; IMDG = International Marine Dangerous Goods; GHS = Globally Harmonized System of Classification and Labeling of Chemicals; lbs = pounds; MARPOL = The International Convention for the Prevention of Pollution from Ships; mm²/sec = millimeters squared per second; OEL = Occupational Exposure Limit; OSHA = Occupational Safety and Health Administration; PEL = Permissible Exposure Limit; PG = Packing Group; PPE = Personal protective equipment; SCBA = Self-Contained Breathing Apparatus; Skin = danger of skin absorption; SARA = Superfund Amendments and Reauthorization Act; STEL = Short Term Exposure Limit; TDG = Transportation of Dangerous Goods; TLV = Threshold Limit Value; TWA = Time-Weighted Average; TPQ = Threshold Planning Quantity; US NTP = United States National Toxicology Program; v/v = volume per volume; w/w = weight per weight; WHMIS = Workplace Hazardous Materials Information System