MATERIAL SAFETY DATA SHEET

Class A	Compressed Gas
Class B1	Flammable Gases
Class B2	Flammable Liquid

PART I: PRODUCTION INFORMATION

Trade Name:	Propane
Other Names:	Propane HD-5, Liquefied Petroleum Gas (LPG), LP Gas, C3, Stenched Propane
Chemical Synonyms and Family:	Diethyl Methane, Propyl Hydride, Alkane, C3H8
Name of Supplier,	Factor Energy Inc.
Address and	240 N. Vidal Street Sarnia, ON N7T 5Y3 Canada
Telephone No.	PH: (519) 332-8978
Poison Control Centre Numbers:	Consult local telephone directory for emergency numbers
Application:	Propane is used as a fuel gas, refrigerant and as a raw material for organic synthesis. The grade determines the propane content. It is supplied as pressurized liquid in tanks.

PART II: TRANSPORTATION

Shipping Name:	Liquefied Petroleum Gas
Class:	Flammable Gas 2.1 Label required: Flammable Gas
Packing Group:	N/A
PIN Number:	UN 1075 or UN 1978
	*Special provisions for transport: Add "Special Commodity" to document if in car load, or container load by rail. Acceptable modes of transportation: air (cargo only), rail, road and water. Not acceptable for transport by passenger aircraft.

Part III: COMPOSITION

Name:	Allowable Limits	% Volume	CAS#
Propane	Simple asphyxiant	>90	74-98-6
Ethane	Simple asphyxiant	<5	74-84-0
Butane	800 ppm	<3	106-97-8
Isobutane	N/A	>.3	75-28-5
Methane	N/A	>.2	74-82-8

PART IV: TYPICAL PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Gas under normal conditions; Liquid under pressure.
Gravity:	0.5
Vapor Pressure:	1435 KPa (max) at 37.8 deg. C
Vapor Density:	1.56 at 0 deg. C (32 deg. F) Air = 1
Solubility:	Slightly soluble in water; soluble in ethanol, ether and chloroform.
Boiling Point:	-42 deg. C (-44 deg. F)
Freezing Point:	-190 deg. C
Percent Volatile:	100%
Odor/Appearance:	Odorless and Colorless in liquid or gas (unless odorized)
Odor Threshold:	4800 ppm
Critical Temperature	96.8 deg. C

PART V: Health Hazard Information

Toxicity Data:	Propane is a simple asphyxiant. LC50 (Human): no effect for 10,000 ppm. Slight dizziness in a few minutes at 100,000 ppm.
Inhalation:	High vapor concentrations are irritating to the eyes, nose, throat and lungs. Symptoms include headaches, dizziness, rapid breathing, vomiting, seizures and may affect the central nervous system. May cause asphyxiation if exposed too long. Remove victim to fresh air. Administer artificial respiration if breathing has stopped. Obtain medical attention immediately.
Eye Contact:	Direct contact with escaping gas or liquefied gas can result in freezing burns or frostbite. If eye tissue is frozen, seek medical attention immediately If tissue is not frozen flush eyes with large amounts of warm water for 15 minutes keeping eyelids open. Physician assessment is mandatory.
Skin Contact:	Direct contact with escaping gas or liquefied gas can result in freezing burns or frostbite. If frostbite has occurred, do not rub the affected areas or flush them with water, but thaw frosted parts by soaking in water. In order to prevent further tissue damage, do not attempt to remove clothing from frostbitten areas. If frostbite has not occurred, immediately and thoroughly wash contaminated skin with soap and water. Physician assessment mandatory.
Ingestion:	Not Likely. *Note to physician; Monitor for respiratory distress. If cough or difficulty in breathing develops, evaluate for respiratory tract irritation, bronchitis pneumonitis. Monitor blood gases to assure adequate ventilation. If vital signs become abnormal or symptoms develop obtain a chest x-ray.

PART VI: FIRE AND EXPLOSION DATA

Flash-point: -103 deg C COC (-153 deg F)

Auto-ignition: 432 deg C (810 deg F)

Flammable Limits (% by Volume): Lower: 2.1% Upper: 10%

General Hazards: Extremely flammable in presence of open flames, sparks and heat. Vapors are heavier than air and may travel considerable distance to sources of ignition and flash back. Toxic gases will form upon combustion.
Auto-refrigeration: drains may become plugged and valves may become inoperable because of the formation of ice due to the expanding vapors or vaporizing liquids. Rapid escape of vapor may generate static charge causing ignition. Severe explosion hazard when exposed to chlorine dioxide. DO NOT cut, weld, heat, drill or pressurize empty containers.
CAUTION: This product has a low flash point, use of water spray when fighting fire may be inefficient if tank, rail car or tank truck is involved in fire, ISOLATE for 1600 meters (1 mile) in all directions. DO NOT extinguish a leaking gas flame unless leak can be stopped. Shut off fuel to fire if it possible to do so without hazard. If this is impossible, withdraw from area and let fire burn out under controlled conditions. Cool containing vessels with water spray in order to prevent pressure build-up, auto ignition or explosion. Self containing breathing apparatus will be required if approaching fire from downwind, or to enter enclosed areas or buildings. Handle damaged cylinders with extreme care.

Hazardous Combustion Products: Carbon Monoxide (CO) Carbon Dioxide (CO_2)

PART VII: REACTIVITY DATA

Stability: This material is stable under normal conditions of storage and use.

Conditions to Avoid: Excessive heat and sources of ignition. Rapid escape of liquid or vapor may generate static charge causing ignition.
Highly reactive with oxidizing agents (peroxides, chlorine).

PART VIII: PREVENTIVE MEASURES

Storage: Store in a cool, dry, well ventilated area, away from heat and ignition sources. Label FLAMMABLE.
Label and store empty containers properly as they may contain product residue.
Protect against physical damage to containers.
Keep away from incompatibles such as oxidizing agents.
Ground fixed equipment and transfer containers/equipment

Handling: DO NOT reuse empty containers without commercial cleaning or reconditioning. Wash hands after handling and before eating. Launder clothes frequently. Discard saturated leather goods. *Workers involved in cleaning, repair or other maintenance on inner surfaces of such equipment should avoid breathing dust generated from such activities

Spill and Leak Procedures: Eliminate all ignition sources; Ground equipment; Evacuate personnel; Avoid direct contact with material. Wear approved protective clothing, eyewear and respiratory equipment. Stop leak if without risk. By forced ventilation, maintain concentration of gas below the range of explosive mixture. Remove the leaking container and allow to bleed off into the atmosphere. For spill or leak: isolate in all directions for at least 50-100 meters (160 - 330 ft.) then evacuate in a downwind direction for at least 800 meters (0.5 miles). Contain liquid (prevent entry into waterway). Check with applicable jurisdiction for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities for specific disposal requirements of spilled material and empty containers. Notify the appropriate authorities immediately.

Personal Protection: Eyes: Face shield or chemical splash goggles in case of splashing
Body: Wear appropriate loose clothing with closed neck and long sleeves to prevent the skin from becoming frozen from contact with the liquid or from contact with vessels containing the liquid.
Hands: Wear insulated gloves to prevent from frostbite.
Feet: Safety boots or shoes.
Respiratory: When exposure is likely to exceed recommended exposure limit, use NIOSH approved respiratory equipment.

PART IX: Toxilogical Information

Routes of Entry: Inhalation, skin contact and eye contact

Acute Lethality: Simple asphyxiant. LC50 (inhalation/human): no effect for 10,000 ppm slight dizziness in a few minutes at 100,000 ppm.

Chronic or Other Toxic Effects:

Dermal Route: Low dermal penetration. Skin irritation has not been shown even with twice daily application for 12 weeks in human volunteers.

Inhalation Route: Subchronic inhalation studies in monkeys show no evidence of organ toxicity or abnormalities.

Oral Route: Not Applicable

Carcinogenicity (ACGIH): Simple asphyxiant

Other Considerations: Acts as a simple asphyxiant - inert gas or vapor. The narcotic or intoxicated effect of a simple asphyxiant may impair a persons judgment, but temporarily and will rapidly disappear in fresh air. Persons with anemia or other conditions of reduced oxygen-carrying capacity may be more sensitive.

PART X: Ecological Information

Environmental Fate: Volatilizes and disperses rapidly. Volatilization is expected to be the dominant fate process.

Bioaccumulation Potential: Propane is readily biodegraded by soil bacteria. The degradation of propane is similar to the degradation of fatty acids.

PART XI: Disposal Considerations

Waste Disposal: Preferred waste management priorities are: (1) incineration with energy recovery. (2) disposal at licensed waste disposal facility. Ensure that disposal or reprocessing is in compliance with government requirements and local disposal regulations.

PART XII: Preparation

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