

international regulations.

Supplemental Hazard Information:

Exposure to concentrations above 100% of the LEL such as 5% or 50,000 ppm may sensitize heart and cause irregular heartbeat. High concentrations may exclude oxygen and cause dizziness and suffocation. Contact with liquid or cold vapor may cause frostbite or freeze burn. Exposure to concentrations above 10% of the LEL may cause a general central nervous system (CNS) depression typical of anesthetic gases or intoxicants. Aliphatic hydrocarbon gases may build up in confined spaces and may cause dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in narcosis, unconsciousness, and possibly lead to death.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Weight %
Propane	74-98-6	85 - 100%
Propene; Propylene	115-07-1	0 - 10%
Isobutane	75-28-5	0 - 7%
Ethane	74-84-0	0 - 7%
Butane	106-97-8	0 - 5%
Ethanethiol; Ethyl mercaptan	75-08-1	0 < 0.1%

SECTION 4. FIRST AID MEASURES

Inhalation	: Remove to fresh air. If not breathing, give artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.
Skin contact	: Take off contaminated clothing and shoes immediately. Wash off immediately with soap and plenty of water. Seek medical advice if symptoms persist or develop.
Eye contact	: In case of eye contact, immediately flush with low pressure, cool water for at least 15 minutes, opening eyelids to ensure flushing. Seek medical attention.
Ingestion	: Ingestion is considered unlikely. If accidentally swallowed obtain immediate medical attention.
Notes to physician	: Symptoms: Dizziness, Headache, Nausea, Frostbite, Vomiting, Discomfort

SECTION 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	: Water spray, Dry chemical, Foam, Carbon dioxide (CO ₂). Fire should not be extinguished unless flow of gas can be immediately stopped.
Specific hazards during fire fighting	: Liquid releases flammable vapors at well below ambient temperatures and readily forms a flammable mixture with air. Dangerous fire and explosion hazard when exposed to heat, sparks or flame. Vapors are heavier than air and may travel long distances to a point of ignition and flash back. Container may explode in heat or fire. Do not allow liquid runoff to enter sewers or public waters.
Special protective equipment	: Firefighting activities that may result in potential exposure to high heat, smoke or

for fire-fighters

toxic by-products of combustion should require NIOSH/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

Further information

- : Keep people away from and upwind of spill/leak. Fire should not be extinguished unless flow of gas can be immediately stopped. If spill or leak has not ignited, determine if water spray may assist in dispersing gas or vapor to protect personnel attempting to stop leak. Use water to cool equipment, surfaces and containers exposed to fire and excessive heat. For large fire the use of unmanned hose holders or monitor nozzles may be advantageous to further minimize personnel exposure. Isolate area, particularly around ends of storage vessels. Withdraw immediately in the event of a rising sound from a venting safety device. Large fires typically require specially trained personnel and equipment to isolate and extinguish the fire.

SECTION 6. ACCIDENTAL RELEASE MEASURES**Personal precautions**

- : Evacuate nonessential personnel and remove or secure all ignition sources. No road flares, smoking or flames in hazard area. Consider wind direction; stay upwind and uphill, if possible. Evaluate the direction of product travel, diking, sewers, etc. to contain spill areas. Vapor cloud may be white, but color will dissipate as cloud disperses - fire explosion may be present after visible cloud is dispersed. Ventilate and gas test area before entering.. Do not touch spilled liquid (frostbite/freeze burn hazard!).

Environmental precautions

- : Carefully contain and stop the source of the spill, if safe to do so. Do not flush down sewer or drainage systems, unless system is designed and permitted to handle such material.

Methods for cleaning up

- : The product evaporates readily. Consider the use of water spray to disperse gas or vapors. Isolate area until gas has dispersed.

SECTION 7. HANDLING AND STORAGE**Precautions for safe handling**

- : See also applicable OSHA regulations for the handling and storage of this product, including, but not limited to, 29 CFR 1910.110 Storage and Handling of Liquefied Petroleum Gases.
- : Keep away from open flames, hot surfaces and sources of ignition. Use only in well-ventilated areas. Store in a well-ventilated area and in accordance with NFPA 58 "Liquefied Petroleum Gas Code".

Conditions for safe storage, including incompatibilities

- : Store only in approved containers. Keep away from flame, sparks, excessive temperatures and open flame. Keep containers closed and clearly labeled. Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose containers to sources of ignition.
- : Keep away from oxidizing agents and strongly acid or alkaline materials. Keep away from food, drink and animal feed.
- : Keep in a dry place. Keep away from heat. No decomposition if stored and applied as directed.

SECTION 8. EXPOSURE CONTROLS / PERSONAL PROTECTION**Exposure Guidelines**

List	Components	CAS-No.	Type:	Value
OSHA Z1	Propane	74-98-6	PEL	1,000 ppm 1,800 mg/m3
	Ethanethiol; Ethyl mercaptan	75-08-1	Ceiling	10 ppm 25 mg/m3
ACGIH	Propane	74-98-6	TWA	1,000 ppm
	Propene; Propylene	115-07-1	TWA	500 ppm
	Isobutane	75-28-5	TWA	1,000 ppm
	Ethane	74-84-0	TWA	1,000 ppm
	Butane	106-97-8	TWA	1,000 ppm
	Ethanethiol; Ethyl mercaptan	75-08-1	TWA	0.5 ppm

- Engineering measures** : Use adequate ventilation to keep gas and vapor concentrations of this product below occupational exposure and flammability limits, particularly in confined spaces. Use explosion-proof equipment and lighting in classified/controlled areas.
- Eye protection** : Where there is a possibility of liquid contact, wear splash-proof safety goggles and faceshield. Ensure that eyewash stations and safety showers are close to the workstation location.
- Hand protection** : Where contact with liquid may occur, wear cold-impervious, insulating gloves.
- Skin and body protection** : Where contact with liquid may occur, wear apron and faceshield. Flame resistant clothing such as Nomex ® is recommended in areas where material is stored or handled.
- Respiratory protection** : Use a NIOSH/ MSHA-approved positive-pressure supplied-air respirator if there is a potential for uncontrolled release, exposure levels are not known, in oxygen-deficient atmospheres, or any other circumstance where an air-purifying respirator may not provide adequate protection. Refer to OSHA 29 CFR 1910.134, ANSI Z88.2-1992, NIOSH Respirator Decision Logic, and the manufacturer for additional guidance on respiratory protection selection.
- Hygiene measures** : Handle in accordance with good industrial hygiene and safety practice, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance** : Colorless gas. Cold vapor cloud may be white but the lack of visible gas cloud does not indicate absence of gas. A colorless liquid when pressurized.
- Odor** : Odorless unless mercaptan added.
- Odor threshold:** : Odor threshold for mercaptan additive is in the 40 part per billion range.
- pH:** : Not applicable
- Melting point/freezing point:** : -189.7°C (-309.4°F)
- Initial boiling point & range:** : -42°C (43.6°F) at 1,013.25 hPa

Flash point:	-104°C (-155.2°F) Method: ASTM D 92
Evaporation rate:	High
Flammability (solid, gas)	Gas
Lower flammability limit	2.1 % (V)
Upper flammability limit	9.5 % (V)
Vapor pressure:	8,400 hPa at 20°C (68°F)
Vapor density:	1.6 at 21.1°C (70.0°F) (Air = 1.0)
Relative density:	0.5 at 15 °C (59°F) (Water = 1.0)
Solubility (H2O):	Negligible
Partition coefficient (Octanol/H2O):	2.36 log Pow
Auto Ignition temperature:	450°C (842°F)
Decomposition temperature:	Heating may cause a fire or explosion. Material does not decompose at ambient temperatures. Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke) are possible hazardous decomposition products.
Viscosity:	No data available
Conductivity:	Hydrocarbon liquids without static dissipater additive may have conductivity below 1 picoSiemens per meter (pS/m). The highest electro-static ignition risks are associated with "ultra-low conductivities" below 5 pS/m. See Section 7 for sources of information on defining safe loading and handling procedures for low conductivity products. Note that conductivity can be reduced by environmental factors such as a decrease in temperature.

SECTION 10. STABILITY AND REACTIVITY

Reactivity:	: Vapors may form explosive mixture with air. Hazardous polymerization does not occur.
Chemical Stability:	: Stable under normal conditions.
Hazardous reactions:	: Can react with strong acids, strong oxidizers, and copper. Explosion hazard when exposed to nickel carbonyl/oxygen mixture.
Conditions to avoid	: Keep away from flame, sparks, excessive temperatures and open flame.
Incompatible materials	: Can react with strong acids, strong oxidizers, and copper
Hazardous decomposition products:	Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke) are Possible hazardous decomposition products..

SECTION 11. TOXICOLOGICAL INFORMATION

Inhalation	: May cause central nervous system disorder (e.g. narcosis involving a loss of coordination, weakness, fatigue, mental confusion and blurred vision) and/or damage. Simple asphyxiant: Acts by displacing oxygen in the lungs thereby diminishing the supply of oxygen available to the blood and tissues. Symptoms include shortness of breath, rapid heart rate, incoordination, lethargy, headaches, nausea, vomiting, and disorientation. Continued lack of oxygen may result in
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convulsions, loss of consciousness and death. Since exercise increases the tissue need for oxygen, symptoms will occur more quickly during exertion in an oxygen-deficient environment. Oxygen in enclosed spaces should be maintained at 21 percent by volume.

Skin Irritation

Direct contact to skin or mucous membranes with liquefied product or cold vapor may cause freeze burns and frostbite.

Eye Irritation

Direct contact to skin or mucous membranes with liquefied product or cold vapor may cause freeze burns and frostbite.

Further Information

: Concentrations above the permissible exposure limit may cause dizziness, headache and inebriation.
Propane exhibits some degree of anesthetic action and is mildly irritating to the mucous membranes.
At high concentrations propane acts as a simple asphyxiant without other significant physiological effects.

Component:

Propane	74-98-6	<u>Skin irritation</u> : Classification: Irritating to skin.Result: Skin irritation <u>Eye irritation</u> : Classification: Irritating to eyes.Result: Mild eye irritation
Propene; Propylene	115-07-1	<u>Acute inhalation toxicity</u> : LC50 ratDose: 658 mg/l Exposure time: 4 h <u>Eye irritation</u> : Classification: Irritating to eyes.Result: Mild eye irritation
Ethane	74-84-0	<u>Skin irritation</u> : Classification: Irritating to skin.Result: Skin irritation <u>Eye irritation</u> : Classification: Irritating to eyes.Result: Eye irritation
Ethaneethiol; Ethyl mercaptan	75-08-1	<u>Acute oral toxicity</u> : LD50 ratDose: 682 mg/kg <u>Acute inhalation toxicity</u> : LC50 ratDose: 11.4 mg/l Exposure time: 4 h <u>Skin irritation</u> : Classification: Irritating to skin.Result: Mild skin irritation <u>Eye irritation</u> : rabbitClassification: Irritating to eyes. Result: Mild eye irritation

NTP

No component of this product which is present at levels greater than or equal to 0.1 % is identified as a known or anticipated carcinogen by NTP.

IARC

No component of this product which is present at levels greater than or equal to 0.1 % is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA

No component of this product which is present at levels greater than or equal to 0.1 % is identified as a carcinogen or potential carcinogen by OSHA.

CA Prop 65

This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

SECTION 12. ECOLOGICAL INFORMATION**Additional ecological information**

: Liquid release is only expected to cause localized, non-persistent environmental damage, such as freezing. Biodegradation of this product may occur in soil and water. Volatilization is expected to be the most important removal process in soil and water. This product is expected to exist entirely in the vapor phase in ambient air.

Component:

Ethaneethiol; Ethyl mercaptan	75-08-1	<u>Acute and prolonged toxicity for aquatic invertebrates</u> : EC50 Species: Daphnia magna (Water flea)
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Dose: 0.38 mg/l
Exposure time: 24 h

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal : Consult federal, state and local waste regulations to determine appropriate waste characterization of material and allowable disposal methods.

SECTION 14. TRANSPORT INFORMATION**CFR**

Proper shipping name : PROPANE
UN-No. : 1978
Class : 2.1
Packing group :

TDG

Proper shipping name : PROPANE
UN-No. : UN1978
Class : 2.1
Packing group :

IATA Cargo Transport

UN UN-No. : UN1978
Description of the goods : PROPANE
Class : 2.1
ICAO-Labels : 2.1
Packing instruction (cargo aircraft) : 200

IATA Passenger Transport

UN-No. : UN1978
Class : 2.1
Not permitted for transport

IMDG-Code

UN-No. : UN 1978
Description of the goods : PROPANE
Class : 2.1
IMDG-Labels : 2.1
EmS Number : F-D S-U
Marine pollutant : No

SECTION 15. REGULATORY INFORMATION

TSCA Status : On TSCA Inventory
DSL Status : All components of this product are on the Canadian DSL list.
SARA 311/312 Hazards : Fire Hazard
Sudden Release of Pressure Hazard
Acute Health Hazard

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts crude oil. Fractions of crude oil, and products (both finished and intermediate) from the crude oil refining process and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, as well as the Clean Water Act may still apply.

SARA III US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

<u>Components</u>	<u>CAS-No.</u>
Propene; Propylene	115-07-1

PENN RTK US. Pennsylvania Worker and Community Right-to-Know Law (34 Pa. Code Chap. 301-323)

<u>Components</u>	<u>CAS-No.</u>
Propene; Propylene	115-07-1
Isobutane	75-28-5
Ethane	74-84-0
Butane	106-97-8
Propane	74-98-6

MASS RTK US. Massachusetts Commonwealth's Right-to-Know Law (Appendix A to 105 Code of Massachusetts Regulations Section 670.000)

<u>Components</u>	<u>CAS-No.</u>
Propane	74-98-6
Butane	106-97-8
Isobutane	75-28-5
Propene; Propylene	115-07-1

NJ RTK US. New Jersey Worker and Community Right-to-Know Act (New Jersey Statute Annotated Section 34:5A-5)

<u>Components</u>	<u>CAS-No.</u>
Propene; Propylene	115-07-1
Isobutane	75-28-5
Ethane	74-84-0
Butane	106-97-8
Propane	74-98-6

California Prop 65:

WARNING: Chemicals known to the State of California to cause cancer, birth defects or other reproductive harm are created by the combustion of propane.

California requires all "persons in the course of doing business" whose products are sold in California to comply with Proposition 65 (Cal. Health and Safety Code Sections 25249.6, et seq.). Accordingly, resellers of this product in California shall comply with Proposition 65, including the provision of any necessary warnings for exposure to chemicals listed by the State of California:

http://oehha.ca.gov/prop65/prop65_list/files/P65single111811.pdf

SECTION 16. OTHER INFORMATIONFurther information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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