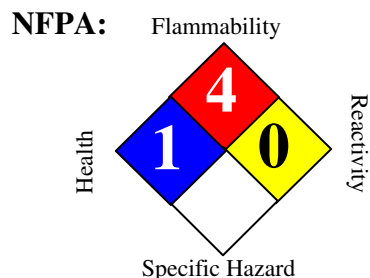


Material Safety Data Sheet

Propane - Refinery Grade



HMIS III:

HEALTH	1
FLAMMABILITY	4
PHYSICAL	0

0 = Insignificant, 1 = Slight, 2 = Moderate, 3 = High, 4 = Extreme

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name	: Propane - Refinery Grade
Synonyms	: Liquefied Petroleum Gas, LPG, Dimethyl Methane, Propylene/ Propane Mix, Olefin Mix, PP Mix, Propylene in PP Mix, Propane in PP Mix, Propylene Refinery Grade, Dimethyl Methane, 888100004784
MSDS Number	: 888100004784 Version : 1.6
Product Use Description	: Fuel gas
Company	: For: Tesoro Refining & Marketing Co. 19100 Ridgewood Parkway, San Antonio, TX 78259
Tesoro Call Center	: (877) 783-7676 Chemtrec (Emergency Contact) : (800) 424-9300

SECTION 2. HAZARDS IDENTIFICATION

Emergency Overview

Regulatory status	: This material is considered hazardous by the Occupational Safety and Health Administration (OSHA) Hazard Communication Standard (29 CFR 1910.1200).
Signal Word	: DANGER
Hazard Summary	: Extremely flammable liquefied gas. Compressed gas May cause fire. Risk of explosion if heated under confinement. High concentrations may exclude oxygen and cause dizziness and suffocation. Contact with liquid or cold vapor may cause frostbite or freeze burn.

Potential Health Effects

Eyes	: Vapors are not irritating. Contact with liquid or cold vapor may cause frostbite or freeze burn.
Skin	: Vapors are not irritating. Direct contact to skin or mucous membranes with liquefied product or cold vapor may cause freeze burns and frostbite. Contact to mucous membranes with liquefied product may cause frostbite and freeze burns. Contact can cause frostbite, freeze burns and/or chemical burns, resulting in severe dermal damage. Skin may become inflamed and painful.
Ingestion	: Ingestion is considered unlikely. Contact to mucous membranes with liquefied product may cause frostbite and freeze burns.
Inhalation	: This product is considered to be non-toxic by inhalation. Inhalation of high concentrations may cause central nervous system depression such as dizziness,

drowsiness, headache, and similar narcotic symptoms, but no long-term effects. Numbness, a "chilly" feeling, and vomiting have been reported from accidental exposures to high concentrations. In high concentrations they will displace oxygen from the breathing atmosphere, particularly in confined spaces. Signs of asphyxiation will be noticed when oxygen is reduced to below 16%, and may occur in several stages. Symptoms may include rapid breathing and pulse rate, headache, dizziness, visual disturbances, mental confusion, incoordination, mood changes, muscular weakness, tremors, cyanosis, narcosis and numbness of the extremities. Unconsciousness leading to central nervous system injury and possibly death will occur when the atmospheric oxygen concentration is reduced to about 6% to 8% or less. Burning any hydrocarbon as a fuel in an area without adequate ventilation may result in hazardous levels of combustion products, including carbon monoxide, and inadequate oxygen levels, which may cause unconsciousness, suffocation, and death.

Target Organs

: Eyes, Skin, Central nervous system, Individuals with pre-existing conditions of the heart, lungs, and blood may have increased susceptibility to symptoms of asphyxia.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	%
Propene; Propylene	115-07-1	0 - 80%
Propane	74-98-6	0 - 100%
Isobutane	75-28-5	0 - 10%
Ethane	74-84-0	0 - 5%
Butane	106-97-8	0 - 5%

SECTION 4. FIRST AID MEASURES

- Inhalation** : If breathed in, move person into 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 all contaminated clothing immediately. Wash off with soap and water. Obtain medical attention.
- 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 advice.
- Ingestion** : Ingestion is considered unlikely. Seek medical attention immediately.
- Notes to physician** : Symptoms: Dizziness, Headache, Nausea, Frostbite, Vomiting, Discomfort

SECTION 5. FIRE-FIGHTING MEASURES

- Form** : Compressed liquefied gas
- Flash point** : -104 °C (-155 °F)
Method: ASTM D 93

Auto Ignition temperature	: 410 °C (770 °F)
Lower explosive limit	: 2 % (V)
Upper explosive limit	: 10 % (V)
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 for fire-fighters	: Firefighting activities that may result in potential exposure to high heat, smoke or 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	: Refinery grade propane may be present in explosive or flammable concentrations when there is no odor present. Keep people away from and upwind of spill/leak. Fire should not be extinguished unless flow of gas can be immediately stopped. Isolate area, particularly around ends of storage vessels. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop a 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. Major fires may require withdrawal, allowing the tank to burn. 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, and toxic hydrogen sulfide gas hazard may be present after visible cloud is dispersed. Ventilate the area. 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. Ventilate and gas test area before entering. Do not flush into surface water or sanitary sewer system.
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

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.
Advice on protection against fire and explosion	: 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".

- Dust explosion class** : Not applicable
- Requirements for storage areas and containers** : 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.
- Advice on common storage** : Keep away from oxidizing agents and strongly acid or alkaline materials. Keep away from food, drink and animal feed.
- Other data** : 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
ACGIH	Propene; Propylene	115-07-1	TWA	500 ppm
	Propane	74-98-6	TWA	1,000 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

- 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** : NIOSH/MSHA approved positive-pressure self-contained breathing apparatus (SCBA) or Type C positive-pressure supplied air with escape bottle must be used for gas concentrations above occupational exposure limits, for potential of uncontrolled release, if exposure levels are not known, or in an oxygen-deficient atmosphere. Flammability limits (i.e., explosion hazard) should be considered when assessing the need to expose personnel to concentrations requiring respiratory protection.
- 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

Form	: Compressed liquefied gas
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 under pressure.
Odor	: Odorless unless unexpected contaminant such as hydrogen sulfide or mercaptan is present.
Flash point	: -104 °C (-155 °F) Method: ASTM D 93
Auto Ignition temperature	: 410 °C (770 °F)
Thermal decomposition	: Heating may cause a fire or explosion.
Lower explosive limit	: 2 % (V)
Upper explosive limit	: 10 % (V)
pH	: Not applicable
Freezing point	: -185 °C (-301 °F)
Boiling point	: -18 °C (-44.00 °F)
Vapor Pressure	: < 150 psig @ 70 °F (21.1 °C)
Relative Vapor Density	: 1.56 at 0 °C (32 °F)
Water solubility	: 62.4 g/l at 25 °C (77 °F)
Viscosity, dynamic	: 0.008 mPa.s at 20 °C (68 °F)
Percent Volatiles	: 100 %

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	: Keep away from strong oxidizers.
Materials to avoid	: Strong acids. Copper. Incompatible with oxidizing agents. Explosion hazard when exposed to chlorine dioxide. Heated chlorine-propane mixtures are explosive under some conditions. Heating barium peroxide with propane causes violent exothermic reaction.
Hazardous decomposition products	: Carbon monoxide, carbon dioxide and noncombusted hydrocarbons (smoke).
Thermal decomposition	: Heating may cause a fire or explosion.
Hazardous reactions	: Vapors may form explosive mixture with air. Note: No decomposition if used as directed.

SECTION 11. TOXICOLOGICAL INFORMATION

Carcinogenicity

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.
- Skin irritation** : Rapid evaporation of the liquid may cause frostbite.
- Eye irritation** : Rapid release of gases which are liquids under pressure may cause frost burns of exposed tissues (skin, eye) due to evaporative cooling.
- Further information** : Concentration above the admissible concentration at the workplace 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:

Propene; Propylene	115-07-1	<p><u>Acute inhalation toxicity:</u> LC50 rat Dose: 658 mg/l Exposure time: 4 h</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Propane	74-98-6	<p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Mild eye irritation</p>
Ethane	74-84-0	<p><u>Skin irritation:</u> Classification: Irritating to skin. Result: Skin irritation</p> <p><u>Eye irritation:</u> Classification: Irritating to eyes. Result: Eye irritation</p>

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.

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

Components

CAS-No.

Propene; Propylene

115-07-1

PENN RTK

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

Components

CAS-No.

Isobutane

75-28-5

Ethane

74-84-0

Butane

106-97-8

Propane

74-98-6

Propene; Propylene

115-07-1

MASS RTK

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

Components

CAS-No.

Propene; Propylene

115-07-1

Propane

74-98-6

Butane

106-97-8

Isobutane

75-28-5

NJ RTK

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

Components

CAS-No.

Isobutane

75-28-5

Ethane

74-84-0

Butane

106-97-8

Propane

74-98-6

Propene; Propylene

115-07-1

California Prop. 65

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

SECTION 16. OTHER INFORMATION

Further 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.

**Template
Prepared by**

: GWU mbH
Birlenbacher Str. 18
D-57078 Siegen

Germany

Telephone: +49-(0)271-88072-0

Revision Date : 10/06/2010

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