Material Safety Data Sheet

Section 1. Chemical Product and Company Identification

Product name **Propane**

In Case of Emergency **Chemtrec:** (800) 424-9300
Total Petrochemicals & Refining USA, Inc.: (800) 322-3462

Supplier Total Petrochemicals & Refining USA, Inc.
P O Box 674411
Houston,TX 77267-4411

Technical Information **For non-emergency** product information: email product.stewardship@total.com

Chemical Family Alkane

MSDS# RF0066

CAS Registry Number 74-98-6

Validation Date **1/1/2015**

Print Date 1/2/2015

Synonym LPG; Liquified Petroleum Gas

Section 2. Hazards Identification

Emergency Overview

FLAMMABLE GAS. MAY CAUSE FLASH FIRE.

CONTENTS UNDER PRESSURE.
CONTAINS MATERIAL WHICH MAY CAUSE LUNGS, SKIN, EYES DAMAGE.
MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.

POTENTIAL SUFFOCATION GAS REDUCES OXYGEN AVAILABLE FOR BREATHING.

Routes of Entry Eye contact. Inhalation. Skin contact.

Potential Acute Health Effects

Eyes May cause eye irritation. Frostbite from direct contact with liquid.

Skin Skin contact may produce burns (frostbite). May cause skin irritation.

Inhalation At high concentrations, dizziness and disorientation. Gas reduces oxygen available for breathing. Acts as a simple asphyxiant. May cause respiratrory tract irritation.

Ingestion As this product rapidly becomes a gas when released, refer to the inhalation section.

Potential Chronic Health Effects

CARCINOGENIC EFFECTS: Not listed as a carcinogen by OSHA, NTP or IARC.

Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.

Medical Conditions Aggravated by Overexposure Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

Overexposure /Signs/ Symptoms Typical route of exposure is expected to be by inhalation. Inhalation of minor amounts is not expected to cause symptoms. Significant inhalation may cause symptoms similar to oxygen deprivation. Symptoms may include the appearance of being intoxicated.

See Toxicological Information (Section 11)

Section 3. Composition and Information on Ingredients

Occupational exposure limits, if available, are listed in Section 8.

Substance Name	CAS #	% by Weight
Propane	74-98-6	> 90
propylene	115-07-1	<5
ethane	74-84-0	<5
n-Butane	106-97-8	<2.5
isobutane	75-28-5	<2.5

Section 4. First Aid Measures

Eye Contact	Flush immediately with large amounts of water. Seek immediate medical attention.
Skin Contact	In case of frost bite, flush with water. Remove affected clothing. Do not rub affected areas. Get medical attention. Launder contaminated clothes.
Inhalation	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
Ingestion	Since the product is a gas and that it is mostly probable that it will be inhaled more than ingested, please consider first to look at the preventive measures in case of inhalation.

Section 5. Fire Fighting Measures

Flammability of the Product	Flammable.
Auto-ignition Temperature	450°C (842°F)
Flash Points	CLOSED CUP: -104.44°C (-156°F). (Tagliabue.).
Flammable Limits	LOWER: 2.3% UPPER: 9.5%
Products of Combustion	These products are carbon oxides (CO, CO2).
Fire Hazards in Presence of Various Substances	Flammable. Extremely flammable in presence of open flames, sparks,or heat.
Explosion Hazards in Presence of Various Substances	Risks of explosion of the product in presence of static discharge: Expected. Risks of explosion of the product in presence of mechanical impact: Not expected. Explosive in presence of open flames and sparks.
Fire Fighting Media and Instructions	Flammable gas. SMALL FIRE: Use DRY chemicals, CO2, halon, alcohol foam or water spray. LARGE FIRE: Use water spray, fog or foam. DO NOT use water jet. Move containing vessels from fire area if without risk. Cool containing vessels with flooding quantities of water until well after fire is out. Cool containing vessels with water jet in order to prevent pressure build-up, autoignition or explosion. DO NOT extinguish a leaking gas flame unless leak can be stopped. Extinguish secondary fire. Handle damaged cylinders with extreme care.
Protective Clothing (Fire)	Wear MSHA/NIOSH approved self-contained breathing apparatus or equivalent and full protective gear (Bunker gear).
Special Remarks on Fire Hazards	DO NOT EXTINGUISH FIRE UNLESS SOURCE CAN BE CLOSED.

Section 6. Accidental Release Measures

Small Spill and Leak	Try to stop the gaseous leak by taping the container with an appropriate material (tape, stretched plastic). Safely stop leak. Shut off all ignition sources. No flares, flames, or smoking in the hazard area. Use water spray to reduce vapors. Isolate area until gas has dispersed.
Large Spill and Leak	Flammable gas. Eliminate all sources of ignition. Use water spray curtain to divert vapor drift. Isolate area until gas has dispersed. Isolate area until gas has dispersed. Warn personnel to move away.

Section 7. Handling and Storage

Handling	Keep away from heat. Keep away from sources of ignition. Empty containers pose a fire risk, evaporate the residue under a fume hood. Ground all equipment containing material. In case of insufficient ventilation, wear suitable respiratory equipment. If you feel unwell, seek medical attention and show the label when possible. Keep container tightly closed and in a well-ventilated place. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.
Storage	Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Segregate from oxidizing materials. Avoid all possible sources of ignition (spark or flame). Ground all equipment containing material. Take precautionary measures against static discharges.

Section 8. Exposure Controls/Personal Protection

Engineering Controls Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Personal Protection

Eyes Splash goggles.

Body Flame retardant clothing covering the entire body.

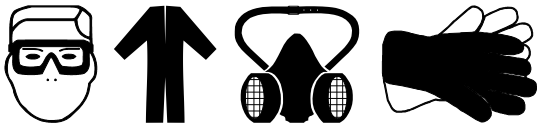
Respiratory

Use a MSHA/NIOSH approved respirator or equivalent at high concentrations.

Hands Chemical resistant gloves if contact is possible. Chemical resistant gloves may not protect against frostbite caused by skin contact.

Feet Shoes.

Protective Clothing (Pictograms)



Personal Protection in Case of a Large Spill Splash goggles. Full suit. Boots. Gloves. At high concentrations, a self contained breathing apparatus should be used to avoid inhalation of the product. Avoid breathing mist and vapors. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Product Name	Exposure Limits
Propane	**NIOSH REL (United States, 6/2008).** TWA: 1000 ppm 10 hour(s). **OSHA PEL (United States, 11/2006).** TWA: 1000 ppm 8 hour(s). **ACGIH TLV (United States, 3/2012).** TWA: 1000 ppm 8 hour(s).
propylene	**ACGIH TLV (United States, 3/2012).** TWA: 500 ppm 8 hour(s).
ethane	**ACGIH TLV (United States, 3/2012).** TWA: 1000 ppm 8 hour(s).
n-Butane	**NIOSH REL (United States, 6/2009).** TWA: 800 ppm 10 hour(s).
isobutane	**NIOSH REL (United States, 6/2009).** TWA: 800 ppm 10 hour(s).

Consult local authorities for acceptable exposure limits.

Section 9. Physical and Chemical Properties

Physical State and Appearance Gas or liquid under pressure.

Color Colorless.

Odor Odorless.

Odor Threshold The highest known value is 23 ppm (Propylene)

Molecular Weight Not applicable.

Molecular Formula CH3-CH2-CH3

Boiling/Condensation Point -42.2°C (-44°F)

Melting/Freezing Point -189.7°C (-309.5°F)

Critical Temperature 96.8°C (206.2°F)

Specific Gravity 0.51 (Water = 1)

Vapor Pressure 547.62 mm of Hg (@ 20°C)

Vapor Density 1.52 (Air = 1)

Volatility 100% (v/v).

VOC 100 (%)

$LogK_{ow}$	The product is more soluble in oil; log(oil/water) = 2.4
Ionicity (in Water)	Non-ionic.
Dispersion Properties	Is not dispersed in cold water, hot water.
Solubility in Water	Very slightly soluble in cold water.

Section 10. Stability and Reactivity

Stability and Reactivity	The product is stable.
Conditions of Instability	Keep away from heat, sparks and flame. Keep away from heat and direct sunlight.
Incompatibility with Various Substances	Extremely reactive or incompatible with strong oxidizing agents.
Hazardous Decomposition Products	Under normal conditions of storage and use, hazardous decomposition products should not be produced. In a fire, hazardous decomposition products may be produced.
Hazardous Polymerization	Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological Information

Toxicity to Animals

Product/ingredient name	Result	Species	Dose	Exposure
n-Butane	LC50 Inhalation Vapor	Rat	658 g/m3	4 hours
isobutane	LC50 Inhalation Vapor	Rat	658000 mg/m3	4 hours
	LC50 Inhalation Gas.	Rat	57 pph	15 minutes

Chronic Effects on Humans

CARCINOGENIC EFFECTS: Not listed as a carcinogen by OSHA, NTP or IARC.

Repeated or prolonged inhalation of vapors may lead to chronic respiratory irritation.

Other Toxic Effects on Humans

Hazardous in case of skin contact (irritant), of eye contact (irritant), of inhalation. Acts as a simple asphyxiant.

Section 12. Ecological Information

Ecotoxicity

Not available.

Biodegradable/OECD

Biodegradation may occur in soil and water, but volatilization is the major process of fate.

Mobility

Because little adsorption occurs, there is medium mobility in soil. In aquatic systems, partitions from the water columen to organic matter within sediments and suspended materials. The half lives for a model river and model pond are 1.9 hr and 2.3 days, respectively. In the atmosphere, reacts with photochemically produced hydroxyl radicals in the atmosphere with a half life of 13 days.

Not availabe

Special Remarks on the Products of Biodegradation

Not Available

Section 13. Disposal Considerations

Waste Information

Recycle to process, if possible. Dispose of according to all federal, state and local applicable regulations.

Waste Stream

The classification of the product may meet the criteria for a hazardous waste.

Consult your local or regional authorities.

Section 14. Transport Information *(for domestic bulk shipments, non-bulk shipments may differ)*

DOT Classification for Bulk Shipments (non bulk shipments may differ) DOT CLASS 2.1: Flammable gas.

Proper Shipping Name/ Description UN1978, Propane, 2.1

UN Number UN1978

Packing Group Not applicable.

Marine Pollutant Not listed in Appendix B to 49CFR172.101

Hazardous Substances Reportable Quantity Not listed in Appendix A of 49 CFR 172.101.

Special Provisions for Transport No additional remark.

TDG Classification TDG CLASS 2.1: Flammable gas.

IMO/IMDG Classification IMDG CLASS 2.1: Flammable gas.

ICAO/IATA Classification IATA CLASS 2.1: Flammable gas.

USCG Proper Shipping Name Propane

Section 15. Regulatory Information

HCS Classification
Flammable gas
Compressed gas
Target organ effects

U.S. Federal Regulations

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: To the best of our knowledge, there are no substances that would be at reportable levels for this regulation in this product.
SARA 302/304 emergency planning and notification: To the best of our knowledge, there are no substances that would be at reportable levels for this regulation in this product.
SARA 302/304/311/312 hazardous chemicals: Propane
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Propane: Fire hazard, Sudden release of pressure

SARA 313 Supplier Notification

This product contains the following EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-to-Know Act of 1986 (40 CFR 372 -Table 372.65).

Product name	CAS number	Concentration (%)
propylene	115-07-1	<5

Clean Air Act (CAA) 112 accidental release prevention: Propane
Clean Air Act (CAA) 112 regulated flammable substances: Propane

International Regulations

WHMIS (Canada) Class B-1: Flammable gas.

CEPA Toxic substances: The following components are listed: Volatile organic compounds
Canadian ARET: None of the components are listed.
Canadian NPRI: The following components are listed: Propane
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

DSCL (EEC) R12- Extremely flammable.

CEPA DSL/NDSL All components are listed or exempted.

International Lists

Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory (ENCS): All components are listed or exempted.
Japan inventory (ISHL): Not determined.
Korea inventory (KECI): All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

State Regulations

Massachusetts Substances: The following components are listed: PROPANE
New Jersey Hazardous Substances: The following components are listed: PROPANE
Pennsylvania RTK Hazardous Substances: The following components are listed: PROPANE

California Proposition 65: To the best of our knowledge, there are no Proposition 65 chemicals present in this product at levels that would require warning under the California Safe Drinking Water and Toxic Enforcement Act.

Section 16. Other Information

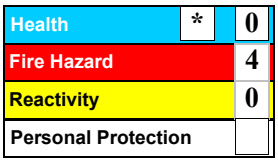
Label requirements

FLAMMABLE GAS. MAY CAUSE FLASH FIRE.

CONTENTS UNDER PRESSURE.
CONTAINS MATERIAL WHICH MAY CAUSE LUNGS, SKIN, EYES DAMAGE.
MAY CAUSE EYE IRRITATION.
MAY CAUSE SKIN IRRITATION.

POTENTIAL SUFFOCATION GAS REDUCES OXYGEN AVAILABLE FOR BREATHING.

Hazardous Material Information System (U.S.A.)



National Fire Protection Association (U.S.A.)

References

Chemtox Database
Hazardous Substance Database

Validated on 1/1/2015. **Printed 1/2/2015.**

Chemtrec:
(800) 424-9300
Total Petrochemicals & Refining USA, Inc.:
(800) 322-3462

Notice to Reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

MSDS Name Propane Refinery Grade **MSDS Code** PROPANE_REF_GRADE

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To obtain an electronic copy of this MSDS, please email: product.stewardship@total.com.