

1. Identification

Material name	PROPANE	
MSDS number	5516	
Version #	18	
Revision date	07-27-2012	
CAS #	74-98-6	
Synonym(s)	LPG * LIQUEFIED PETROLEUM GAS * C3	
Manufacturer	Flint Hills Resources Corpus Christi, LLC P. O. Box 2608 Corpus Christi, TX 78403 United States	
Telephone numbers - 24 hour emergency assistance		
	Chemtrec	800-424-9300
	Flint Hills Resources Corpus Christi, LLC	361-241-4811
Telephone numbers - general assistance		
	8-5 (M-F, CST)	361-241-4811
	8-5 (M-F, CST) MSDS Assistance	316-828-7988
	Email: msdsrequest@fhr.com	

2. Hazards identification

Emergency overview	DANGER! COLORLESS GAS AT ROOM TEMPERATURE AND PRESSURE COLORLESS LIQUID UNDER PRESSURE FAINT ODOR AT HIGH CONCENTRATIONS MERCAPTAN ODORANT (NATURAL GAS ODOR) ADDED PRIOR TO SHIPPING HEALTH HAZARDS MAY REDUCE OXYGEN AND CAUSE RAPID SUFFOCATION BREATHING HIGH CONCENTRATIONS CAN CAUSE IRREGULAR HEARTBEATS WHICH MAY BE FATAL OVEREXPOSURE MAY CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION DIRECT CONTACT WITH GAS UNDER PRESSURE MAY CAUSE FROSTBITE (COLD BURNS) SEE "TOXICOLOGICAL INFORMATION" (SECTION 11) FOR MORE INFORMATION FLAMMABILITY HAZARDS FLAMMABLE COMPRESSED GAS/LIQUID FORMS EXPLOSIVE MIXTURES WITH AIR MAY CAUSE FLASH FIRE OR EXPLOSION REACTIVITY HAZARDS STABLE
Potential health effects	
Routes of exposure	Inhalation, skin, and eye contact.
Eyes	Direct contact with compressed gas may cause frostbite (cold burns) and permanent damage.
Skin	Direct contact with compressed gas may cause frostbite (cold burns) and skin damage. Short term contact may result in tissue destruction and severe burns.

Inhalation

Breathing high concentrations may be harmful. May cause central nervous system depression or effects. Symptoms may include headache, excitation, euphoria, dizziness, incoordination, drowsiness, light-headedness, blurred vision, fatigue, tremors, convulsions, loss of consciousness, coma, respiratory arrest and death, depending on the concentration and duration of exposure.

Breathing high concentrations of this material, for example, in a confined space or by intentional abuse, can cause irregular heartbeats which can cause death.

Overexposure to this material may cause systemic damage including target organ effects listed under "Toxicological Information" (Section 11).

Ingestion

Not a normal route of exposure.

3. Composition/information on ingredients

Components	CAS #	Concentration*
PROPANE	74-98-6	90 - 100 %
ETHANE	74-84-0	0 - 6 %
PROPYLENE	115-07-1	0 - 5 %
ISOBUTANE	75-28-5	0 - 2.5 %
N-BUTANE	106-97-8	0 - 1 %
ETHYL MERCAPTAN (USED AS A MALODORANT)	75-08-1	0 - 50 ppm

*Values do not reflect absolute minimums and maximums; these values are typical which may vary from time to time.

Composition comments

This Material Safety Data Sheet is intended to communicate potential health hazards and potential physical hazards associated with the product(s) covered by this sheet, and is not intended to communicate product specification information. For product specification information, contact your Flint Hills Resources, LP representative.

4. First aid measures**First aid procedures****Eye contact**

Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. GET IMMEDIATE MEDICAL ATTENTION.

Skin contact

For frostbite or freeze burns, keep affected area warm by immersing or flushing with warm water. GET IMMEDIATE MEDICAL ATTENTION.

Inhalation

Remove to fresh air. If not breathing, institute rescue breathing. If breathing is difficult, ensure airway is clear and give oxygen. If heart has stopped, immediately begin cardiopulmonary resuscitation (CPR).

Ingestion

Keep affected person warm and at rest. GET IMMEDIATE MEDICAL ATTENTION.

Due to the volatile nature of this material, ingestion is not a likely route of exposure.

Notes to physician

INHALATION: This material (or a component) sensitizes the myocardium to the effects of sympathomimetic amines. Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in individuals exposed to this material. Administration of sympathomimetic drugs should be avoided.

5. Fire-fighting measures**Flammable properties**

Material will burn in a fire.

Extremely flammable. Vapors form flammable or explosive mixtures with air at room temperature. Vapor or gas may spread to distant ignition sources and flash back.

Explosion hazard if exposed to extreme heat.

Extinguishing media**Suitable extinguishing media**

Use dry chemical, carbon dioxide, water spray or fog to extinguish fire.

Protection of firefighters**Specific hazards arising from the chemical**

Combustion may produce COx, SOx, and other decomposition products in the case of incomplete combustion.

Fire fighting equipment/instructions

Shut off source of flow, if possible. Do not attempt to extinguish fire if gas source cannot be shut off first.

Evacuate area and fight fire from a safe distance.

If leak or spill has not ignited, ventilate area and use water spray to disperse gas or vapor, cool adjacent structures, and to protect personnel attempting to stop a leak.

Containers can build up pressure if exposed to heat (fire). Stay away from storage tank ends. Withdraw immediately in case of rising sound from venting safety device or any discoloration of storage tank due to fire.

Be aware that a BLEVE (Boiling Liquid Expanding Vapor Explosion) may occur unless surfaces are kept cool with water.

Firefighters must wear NIOSH approved positive pressure breathing apparatus (SCBA) with full face mask and full protective equipment.

6. Accidental release measures**Environmental precautions**

Eliminate all sources of ignition. Isolate hazard area and deny entry.

If material is released to the environment, take immediate steps to stop and contain release. Caution should be exercised regarding personnel safety and exposure to the released material. Notify local authorities and the National Response Center, if required.

Other information

Keep unnecessary people away. Isolate area for at least 100 meters (330 feet) in all directions to preserve public safety. For large leaks, consider initial evacuation for at least 800 meters (1/2 mile).

Keep ignition sources out of area and shut off all ignition sources. Isolate hazard area and deny entry. Use water spray to reduce vapors. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

Emergency action

Eliminate and/or shut off ignition sources and keep ignition sources out of the area. Keep unnecessary people away; isolate hazard area and deny entry. IF TANK, RAILCAR OR TANK TRUCK IS INVOLVED IN A FIRE, isolate for 1600 meters (1 mile) in all directions. (See Exposure Controls/Personal Protection, Section 8.)

7. Handling and storage**Handling**

Bond and ground lines and equipment (tank, transfer lines, pump, floats, etc.) used during transfer to reduce the possibility of static spark-initiated fire or explosion. Use non-sparking tools. Do not cut, grind, drill, weld (or introduce any other ignition source) on empty containers or reuse containers unless adequate precautions are taken.

Do not eat, drink or smoke in areas of use or storage.

Do not breathe gas.

Avoid contact with skin or eyes.

Wash thoroughly after handling.

Storage

Store in gas cylinders in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Avoid contact with strong oxidizers.

Empty containers may contain material residue. Do not reuse without adequate precautions.

Do not eat, drink or smoke in areas of use or storage.

8. Exposure controls / personal protection

Occupational exposure limits

ACGIH

Components

Type

Value

ETHYL MERCAPTAN (USED AS A MALODORANT) (75-08-1)	TWA	0.5 ppm
ISOBUTANE (75-28-5)	STEL	1000.0 ppm
N-BUTANE (106-97-8)	TWA	1000.0 ppm
PROPYLENE (115-07-1)	TWA	500.0 ppm

U.S. - OSHA

Components

Type

Value

ETHYL MERCAPTAN (USED AS A MALODORANT) (75-08-1)	Ceiling	10.0 ppm
PROPANE (74-98-6)	TWA	1000.0 ppm

U.S. - Minnesota (MNOSHA)

Components

Type

Value

ETHYL MERCAPTAN (USED AS A MALODORANT) (75-08-1)	TWA	0.5 ppm
N-BUTANE (106-97-8)	TWA	800.0 ppm
PROPANE (74-98-6)	TWA	1000.0 ppm

U.S. - Alaska (AKOSH)

Components

Type

Value

ETHYL MERCAPTAN (USED AS A MALODORANT) (75-08-1)	TWA	0.5 ppm
N-BUTANE (106-97-8)	TWA	800.0 ppm
PROPANE (74-98-6)	TWA	1000.0 ppm

Exposure guidelines

NOTE: Only ingredients with validated exposure limits are shown in section 8.

Engineering controls

Ventilation and other forms of engineering controls are the preferred means for controlling exposures.

Generally, this material is contained within vessels and piping designed to withstand expected operating conditions. Certain operations, such as loading, unloading and on-line sampling, generally involve higher risk of exposure, and special equipment is often designed for these activities.

Personal protective equipment

Eye / face protection

Keep away from eyes. Eye contact can be avoided by using chemical safety glasses, goggles and/or face shield. Have eye washing facilities readily available where eye contact can occur.

Skin protection

Avoid skin contact with this material. Use appropriate chemical protective gloves when handling. Additional protective clothing may be necessary.

Good personal hygiene practices such as properly handling contaminated clothing, using wash facilities before entering public areas and restricting eating, drinking and smoking to designated areas are essential for preventing personal chemical contamination.

Respiratory protection

If ventilation cannot reduce airborne concentrations below acceptable limits, appropriate respiratory protection should be used. Use a supplied air respirator. Material may displace oxygen. Ensure that sufficient oxygen is present.

9. Physical and chemical properties

Color	Colorless
Odor	Faint at high concentration Mercaptan odorant (natural gas odor) added prior to shipping
Odor threshold	Not available
Physical state	Gas
Form	Gas at room temperature and pressure; liquid under high pressure
pH	Not available
Melting point	-310 °F (-190 °C)
Freezing point	-310 °F (-190 °C)
Boiling point	-44 °F (-42.2 °C)

Flash point	-156 °F (-104.4 °C)
Evaporation rate	Liquid boils rapidly to gas at room temperature
Flammability	Not available
Flammability limits in air, upper, % by volume	9.5 %
Flammability limits in air, lower, % by volume	2.2 %
Vapor pressure	180 - 200 RVP (Reid) at 100 °F (38 °C)
Vapor density	1.5
Specific gravity	0.49 - 0.51 at 60/60 °F (15.6/15.6 °C)
Relative density	Not available
Solubility (water)	Slightly soluble
Solubility (organic solvent)	Not available
Partition coefficient (n-octanol/water)	2.36 Kow
Auto-ignition temperature	842 °F (450 °C)
Decomposition temperature	Not available
VOC	100 %
Pour point	Not available
Viscosity	Not available
Bulk density	4.09 - 4.24 lb/gal
Density	Not available
Surface tension	Not available
Dissociation constant	Not available
Percent volatile	100 %
Explosivity	Not available
Hydrolysis	Not available
Granulometry	Not available
Molecular weight	44.09
Molecular formula	C3H8
Chemical family	Aliphatic Hydrocarbon

10. Stability and reactivity

Chemical stability	Material is stable under normal conditions.
Conditions to avoid	Avoid unventilated areas, heat, open flames, sparks and ungrounded electrical equipment.
Incompatible materials	Incompatible with oxidizing agents. See precautions under Handling & Storage (Section 7).
Hazardous decomposition products	Not anticipated under normal conditions.
Possibility of hazardous reactions	Not anticipated under normal conditions.

11. Toxicological information

Carcinogenicity

ACGIH Carcinogens

PROPYLENE (CAS 115-07-1)

A4 Not classifiable as a human carcinogen.

IARC Monographs. Overall Evaluation of Carcinogenicity

PROPYLENE (CAS 115-07-1)

3 Not classifiable as to carcinogenicity to humans.

Pre-existing conditions aggravated by exposure	Pre-existing medical conditions which may be aggravated by exposure include disorders of the skin and respiratory tract.
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Toxicological data

PROPYLENE: At extremely high levels propylene gas acts as a general anesthetic and central nervous system depressant. Studies in laboratory animals indicate evidence of mild, reversible hydrocarbon nephropathy in male rats exposed to levels of 1000-4,500 ppm propylene for 90-days. The International Agency for Research in Cancer (IARC) has determined that there is inadequate evidence in experimental animals for the carcinogenicity of propylene. Overall evaluation: Propylene is not classifiable as to its carcinogenicity to humans (Group 3).

ALKANE GAS: Studies in laboratory animals indicate that exposure to high levels (1-10%) of alkane gases may cause cardiac arrhythmias (irregular heartbeats) which may be serious or fatal. Human incidences of ventricular fibrillation and fatalities have also been reported following inhalation of aerosols containing certain alkanes.

Exposure to this material may cause adverse effects or damage to the following organs or organ systems: eyes, skin, central nervous system, heart, and respiratory tract.

12. Ecological information

Ecotoxicity	Material not classified as harmful to aquatic organisms.
Persistence and degradability	Readily biodegradable in the environment.
Bioaccumulation / Accumulation	Not likely to bioaccumulate in aquatic organisms.
Mobility in environmental media	After release, disperses into the air.

13. Disposal considerations

Disposal instructions	This material, as supplied, when discarded or disposed of, is a hazardous waste according to Federal Regulations due to the material exhibiting a hazardous characteristic under Subpart C of 40 CFR 261. Under RCRA, it is the responsibility of the user of the material to determine, at the time of disposal, whether the material meets RCRA criteria for hazardous waste.
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The transportation, storage, treatment and disposal of RCRA waste material must be conducted in compliance with federal regulations. Check state and local regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate. Disposal of this material must be conducted in compliance with all federal, state and local regulations.

For additional handling information and protection of employees, see Section 7 (Handling and Storage) and Section 8 (Exposure Controls/Personal Protection).

14. Transport information

General	<p>BILL OF LADING - BULK (U. S. DOT): UN1075, Petroleum Gases, Liquefied, 2.1*</p> <p>BILL OF LADING - NON-BULK (U. S. DOT): UN1075, Petroleum Gases, Liquefied, 2.1*</p> <p>The following language shall be added to the proper shipping description for liquefied petroleum gas:</p> <p>The words "NONCORROSIVE" or "NONCOR" to indicate the suitability for shipping "NONCORROSIVE" liquefied petroleum gas in a cargo tank made of quenched and tempered steel as authorized by 49 CFR 173.315(a); or</p> <p>The words "NOT FOR Q AND T TANKS" for grades of liquefied petroleum gas other than "Noncorrosive".</p> <p>The above description may not cover shipping in all cases, please consult 49 CFR 100-185 for specific shipping information.</p>
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15. Regulatory information

US federal regulations

All ingredients are on the TSCA inventory, or are not required to be listed on the TSCA inventory.

A release of this material, as supplied, may be exempt from reporting under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA - 40 CFR 302) by the petroleum exclusion. Releases may be reportable to the National Response Center (800-424-8802) under the Clean Water Act, 33 U.S.C. 1321(b)(3) and (5).

This material contains toxic chemical(s) in excess of the applicable de minimis concentration that are subject to the annual toxic chemical release reporting requirements of the Superfund Amendments and Reauthorization Act (SARA) Section 313 (40 CFR 372). This information must be included in all MSDSs that are copied and distributed for this material.

This material contains substances subject to accident prevention regulations when present above the applicable threshold quantities (Section 112(r) of the Clean Air Act).

Check local, regional or state/provincial regulations for any additional requirements as these may be more restrictive than federal laws and regulations. Failure to report may result in substantial civil and criminal penalties.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

PROPYLENE (CAS 115-07-1)

1.0 %

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories

Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - Yes
Pressure Hazard - Yes
Reactivity Hazard - No

State regulations

Based on available information this product does not contain any components or chemicals currently known to the State of California to cause cancer, birth defects or reproductive harm at levels which would be subject to Proposition 65. Reformulation, use or processing of this material may affect its composition and require re-evaluation.

16. Other information

NFPA ratings

Health: 1
Flammability: 4
Instability: 0

HMIS® ratings

Health: 1
Flammability: 4
Physical hazard: 0

Disclaimer

NOTICE: The information presented herein is based on data considered to be accurate as of the date of preparation of this Material Safety Data Sheet. Adequate training and instruction should be given by you to your employees and affected personnel. Appropriate warnings and safe handling procedures should be provided by you to handlers and users. Additionally, the user should review this information, satisfy itself as to its suitability and completeness, and pass on the information to its employees or customers in accordance with the applicable federal, state, provincial or local hazard communication requirements. This MSDS may not be used as a commercial specification sheet of manufacturer or seller, and no warranty or representation, expressed or implied, is made as to the accuracy or comprehensiveness of the foregoing data and safety information, nor is any authorization given or implied to practice any patented invention without a license. In addition, vendor neither assumes nor retains any responsibility for any damage or injury resulting from abnormal use, from any failure to adhere to appropriate practices, or from any hazards inherent in the nature of the material. Moreover, unless an employee or a customer accesses or receives a MSDS directly from the company, there is no assurance that a document obtained from alternate sources is the most currently available MSDS.

Further information

This material has been malodorized to facilitate its identifiability. It has been determined that the odorant can diminish or fade due to exposure to oxidized substances, including the following:

1. Adsorption ("sticking") of the odorant molecules to the inside surface of metal storage containers and pipes, particularly (i) those that are new; (ii) those whose interior surfaces have been exposed to the atmosphere while out of service; or (iii) those whose interior surfaces are rough.
2. The presence of ordinary red rust (iron or ferric oxide) inside a storage container or piping.
3. Selective adsorption ("filtering") of the odorant molecules by soil in the case of underground leaks.
4. Adsorption of the odorant molecules on the walls (particularly those made of rough woods, rock or any other types of masonry) or on the fabric of draperies, furniture or carpets in rooms where there is little or no air circulation.

Physical and environmental conditions such as competing odors, common colds, allergies, or smoking may lessen a person's ability to smell the odorant. In addition, prolonged exposure to the odorant or exposure to extremely high concentrations of the odorant can diminish a person's ability to smell the odorant. Finally, some individuals are not capable of smelling the odor emitted by the odorant.

All material users and handlers should acquaint themselves with what they determine to be the usual odor of odorized material. Further, as such individuals use or handle the material, proper precautions should be taken to ensure that the exposure of the material to substances such as those identified above is eliminated or to properly passivate such substances prior to use. Frequent sniff tests should be conducted. Handlers and retailers of the material should conduct periodic stain tube or other testing to ensure proper levels of the odorant are maintained and documented. Special attention should be focused on storage or transportation systems which exhibit the characteristics described above. In the event a lower level of odorant than required by law is discovered pursuant to the stain tube or other testing, additional odorant, or additional, properly odorized propane, should be added.

Purchaser and all downstream individuals who engage in the re-selling of material should continually communicate, inform, and train their employees, customers, and the public at large regarding the characteristics and hazards of the product, including specifically the possible failure of the odorant warning system under certain circumstances.

Issue date

07-27-2012

This data sheet contains changes from the previous version in section(s):

This document has undergone significant changes and should be reviewed in its entirety.

Completed by

Flint Hills Resources, LP - Operations EH&S