

SAFETY DATA SHEET

1. Identification

Product identifier	PROPANE
Other means of identification	
SDS number	5516
Synonyms	LPG * LIQUEFIED PETROLEUM GAS * C3
Recommended use	Chemical feedstock. Home heating. Fuel.
Recommended restrictions	Other uses are not recommended unless an assessment is completed, prior to commencement of that use, which demonstrates that the use will be controlled.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Supplier

Flint Hills Resources, LP
4111 E. 37th St. North
Wichita, KS 67220
67220-3203
United States

Telephone numbers – 24 hour emergency assistance

Chemtrec 800-424-9300

Telephone numbers – general assistance

8-5 (M-F, CST) MSDS Assistance 316-828-7988

Email: msdsrequest@fhr.com

2. Hazard(s) identification

Physical hazards	Flammable gases	Category 1
	Gases under pressure	Liquefied gas
Health hazards	Not classified.	
Environmental hazards	Not classified.	
OSHA defined hazards	Simple asphyxiant	

Label elements



Signal word

Danger

Hazard statement

Extremely flammable gas. Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.

Precautionary statement

Prevention

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Response

Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

Storage

Protect from sunlight. Store in a well-ventilated place.

Disposal

Not applicable.

3. Composition/information on ingredients

Substances

Chemical name	Common name and synonyms	CAS number	%
PROPANE		74-98-6	90 - 100
Additional components	Common name and synonyms	CAS number	%
Chemical name			
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		75-08-1	0 - 0.005

Composition comments Ethyl mercaptan is used in propane as a malodorant.

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

This 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

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).

Keep affected person warm and at rest. 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.

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.

Ingestion

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

Most important symptoms/effects, acute and delayed

INHALATION:

Asphyxiant gas. High concentrations in the immediate area can displace oxygen causing the feeling of suffocation and can cause central nervous system depression from oxygen deprivation. 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.

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.

EYES:

Direct contact with compressed gas may cause frostbite (cold burns) and permanent damage. Fumes or vapors may also produce eye irritation.

INGESTION:

Not a normal route of exposure.

Indication of immediate medical attention and special treatment needed

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

Suitable extinguishing media

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

Unsuitable extinguishing media

Do not direct water at spill or source of leak.

Specific hazards arising from the chemical

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

Material will burn in a fire.

Vapors may form explosive mixtures with air. Vapors can travel to a source of ignition and flash back.

Explosion hazard if exposed to extreme heat.

Shut off source of flow, if possible.

Special protective equipment and precautions for firefighters

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. Always stay away from tanks engulfed in flame.

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

Personal precautions, protective equipment and emergency procedures

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. For spills in confined areas, ensure adequate ventilation. For spills outdoors, stay upwind. IF TANK, RAILCAR OR TANK TRUCK IS INVOLVED IN A FIRE, isolate for in all directions. Evacuate area endangered by release as required. Wear appropriate personal protective equipment. See Exposure Controls/Personal Protection (Section 8).

Methods and materials for containment and cleaning up

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. Use water spray to reduce vapors. For leaks in confined areas, ensure adequate ventilation. Stop leak when safe to do so.

See Exposure Controls/Personal Protection (Section 8).

Environmental precautions

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

7. Handling and storage

Precautions for safe 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 use electronic devices while handling, unless the device is certified as intrinsically safe as they could present ignition sources.

Avoid contact with strong oxidizers. Avoid release to the environment. Do not cut, grind, drill, weld (or introduce any other ignition source) on empty containers. Do not reuse containers unless adequate precautions are taken.

Contents under pressure. Containers and delivery lines may be cold enough to present frostbite hazards. Gas can accumulate in confined spaces and limit oxygen availability for breathing. Use adequate ventilation.

Avoid personal contact with this material. Always observe good personal hygiene measures, such as removing contaminated clothing and protective equipment, washing after handling the material and before entering public areas. Restrict eating, drinking and smoking to designated areas to prevent personal chemical contamination. Routinely wash work clothing and protective equipment to remove contaminants. Do not breathe gas.

Conditions for safe storage, including any incompatibilities

Store in tightly closed containers in a cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles. Ground/bond container and equipment. Avoid contact with strong oxidizers. Empty containers may contain material residue. Do not reuse without adequate precautions. Store in gas cylinders in cool, dry, isolated, well-ventilated area away from heat, sources of ignition and incompatibles.

8. Exposure controls/personal protection**Occupational exposure limits****US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Material	Type	Value
PROPANE	PEL	1800 mg/m ³ 1000 ppm

Components	Type	Value
PROPANE (CAS 74-98-6)	PEL	1000 ppm

Additional components	Type	Value
ETHYL MERCAPTAN (CAS 75-08-1)	Ceiling	10 ppm

US. ACGIH Threshold Limit Values

Additional components	Type	Value
n-BUTANE (CAS 106-97-8)	STEL	1000 ppm

ISOBUTANE (CAS 75-28-5)	STEL	1000 ppm
-------------------------	------	----------

PROPYLENE (CAS 115-07-1)	TWA	500 ppm
--------------------------	-----	---------

ETHYL MERCAPTAN (CAS 75-08-1)	TWA	0.5 ppm
-------------------------------	-----	---------

ETHYL MERCAPTAN (CAS 75-08-1)	TWA	0.5 ppm
-------------------------------	-----	---------

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value
PROPANE	TWA	1800 mg/m ³ 1000 ppm

Components	Type	Value
PROPANE (CAS 74-98-6)	TWA	1000 ppm

Additional components	Type	Value
n-BUTANE (CAS 106-97-8)	TWA	800 ppm

ISOBUTANE (CAS 75-28-5)	TWA	800 ppm
-------------------------	-----	---------

ETHYL MERCAPTAN (CAS 75-08-1)	Ceiling	0.5 ppm
-------------------------------	---------	---------

Biological limit values

No biological exposure limits noted for the ingredient(s).

Appropriate engineering controls

Consider the following when employing engineering controls and selecting personal protective equipment: potential hazards of the material, applicable exposure limits, job activities, and other substances in the work place. Explosion-proof ventilation and other forms of engineering controls are the preferred means for controlling exposures below occupational exposure limits and guidelines.

Individual protection measures, such as 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

Hand protection Avoid skin contact with this material. Use chemical resistant gloves when handling this material. Contact the glove manufacturer for specific advice on glove selection regarding permeability and breakthrough times for your use conditions. Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Wear cold insulating gloves.

Other Avoid skin contact with this material. Additional protective clothing may be necessary.

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.

Thermal hazards Direct contact with compressed gas may cause frostbite (cold burns) and permanent damage. Wear appropriate thermal protective clothing. Additional protection may be necessary to prevent skin contact including use of apron, arm covers, face shield, or boots.

9. Physical and chemical properties

Appearance

Physical state Gas.
Form Gas at room temperature and pressure; liquid under high pressure
Color Colorless

Odor Faint at high concentration
Mercaptan odorant (natural gas odor) added prior to shipping

Odor threshold Not available.

pH Not available

Melting point/freezing point -310 °F (-190 °C)

Initial boiling point and boiling range -44 °F (-42.2 °C)

Flash point -156 °F (-104.44 °C)

Evaporation rate Liquid boils rapidly to gas at room temperature

Flammability (solid, gas) Flammable gas.

Upper/lower flammability or explosive limits

Flammability limit - lower (%) 2.2 %

Flammability limit - upper (%) 9.5 %

Explosive limit - lower (%) See flammability limit

Explosive limit - upper (%) See flammability limit

Vapor pressure 180 - 200 RVP (Reid) at 100 °F (38 °C)

Vapor density 1.5

Relative density 0.49 - 0.51 at 60/60 °F (15.6/15.6 °C)

Solubility(ies)

Solubility (water) Slightly soluble

Partition coefficient (n-octanol/water) 2.36 Kow

Auto-ignition temperature 842 °F (450 °C)

Decomposition temperature 1202 °F (650 °C)

Viscosity Not applicable

Solubility (organic solvent) Not available.

Other information

Bulk density 4.09 - 4.24 lb/gal

Chemical family Aliphatic Hydrocarbon

Molecular formula C3H8

Molecular weight 44.09

Percent volatile 100 %

VOC (Weight %) 100 %

10. Stability and reactivity

Reactivity See statements below.

Chemical stability Material is stable under normal conditions.

Possibility of hazardous reactions Not anticipated under normal conditions.

Conditions to avoid Avoid unventilated areas, heat, open flames, sparks and ungrounded electrical equipment.

Incompatible materials Incompatible with strong oxidizers. See precautions under Handling & Storage (Section 7).

Hazardous decomposition products Not anticipated under normal conditions.

11. Toxicological information

Information on likely routes of exposure

Inhalation Likely route of exposure
Skin contact Likely route of exposure
Eye contact Likely route of exposure
Ingestion Not a likely route of exposure

Symptoms related to the physical, chemical and toxicological characteristics

INHALATION:
Asphyxiant gas. High concentrations in the immediate area can displace oxygen causing the feeling of suffocation and can cause central nervous system depression from oxygen deprivation. 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.

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.

EYES:
Direct contact with compressed gas may cause frostbite (cold burns) and permanent damage. Fumes or vapors may also produce eye irritation.

INGESTION:
Not a normal route of exposure.

Information on toxicological effects

Acute toxicity Not classified.

Components	Species	Test Results
PROPANE (CAS 74-98-6)		
Acute		
Inhalation		
<i>Gas</i>		
LC50	Mouse	1237 mg/l, 2 hr
Skin corrosion/irritation	Not classified.	
Serious eye damage/eye irritation	Not classified.	
Respiratory or skin sensitization		
Respiratory sensitization	Not classified.	
Skin sensitization	Not classified.	
Germ cell mutagenicity	Not classified.	
Carcinogenicity	Not classified.	
IARC Monographs. Overall Evaluation of Carcinogenicity		
PROPYLENE (CAS 115-07-1) 3 Not classifiable as to carcinogenicity to humans.		
US. National Toxicology Program (NTP) Report on Carcinogens		
Not listed.		
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)		
Not regulated.		
Reproductive toxicity	Not classified.	
Specific target organ toxicity - single exposure	Not classified.	
Specific target organ toxicity - repeated exposure	Not classified.	
Aspiration hazard	Not classified.	

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 some alkane or alkene 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 these materials.

12. Ecological information

Ecotoxicity	Material not classified as harmful to aquatic organisms.
Persistence and degradability	Readily biodegradable in the environment.
Bioaccumulative potential	Not likely to bioaccumulate in aquatic organisms.
Mobility in soil	After release, disperses into the air.
Other adverse effects	No other adverse effects expected.

13. Disposal considerations

Disposal instructions	<p>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.</p> <p>The transportation, storage, treatment and disposal of waste material must be conducted in compliance with federal, state, and local regulations. Under RCRA it is the responsibility of the user of the material to determine, at the time of disposal, whether this material meets RCRA criteria for hazardous waste.</p> <p>For additional handling information and protection of employees, see Section 7 (Handling and Storage) and Section 8 (Exposure Controls/Personal Protection).</p>
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The proper waste code must be evaluated at the time of disposal and should be determined by the user and waste disposal company.
Waste from residues / unused products	Dispose of this material in accordance with all applicable local and national regulations.
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal in accordance with government regulations. Packaging may contain residue that can be hazardous.

14. Transport information

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not classified for MARPOL. Please contact the Transportation Compliance CSO if transportation mode is ship or vessel to determine the need for a MARPOL classification.
General information	<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 or Transport Compliance Specialist (CSO).</p>

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 SDSs that are copied and distributed for this material.

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

CERCLA Hazardous Substance List (40 CFR 302.4)

ETHYL MERCAPTAN (CAS 75-08-1)	Listed.
ISOBUTANE (CAS 75-28-5)	Listed.
n-BUTANE (CAS 106-97-8)	Listed.
PROPANE (CAS 74-98-6)	Listed.
PROPYLENE (CAS 115-07-1)	Listed.

US EPCRA (SARA Title III) Section 304 - Extremely Hazardous Spill: Reportable quantity

Not regulated.

US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

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

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

ETHANE (CAS 74-84-0)
ETHYL MERCAPTAN (CAS 75-08-1)
ISOBUTANE (CAS 75-28-5)
n-BUTANE (CAS 106-97-8)
PROPANE (CAS 74-98-6)
PROPYLENE (CAS 115-07-1)

Food and Drug Administration (FDA)	Total food additive
	Direct food additive
	GRAS food additive

US state regulations

US. California Proposition 65

Based on available information this product does not contain any components or chemicals current California to cause cancer, birth defects or reproductive harm at levels which would be subject to P Reformulation, use or processing of this material may affect its composition and require re-evaluati

16. Other information, including date of preparation or last revision

Issue date	01-14-2015
Revision date	04-26-2016
Version #	02
HMIS® ratings	Health: 1 Flammability: 4 Physical hazard: 0

NFPA ratings

Health: 1
Flammability: 4
Instability: 0

Disclaimer

THIS SDS HAS BEEN PREPARED TO COMPLY WITH FEDERAL REGULATIONS THAT ARE INTENDED TO QUICKLY PROVIDE USEFUL INFORMATION TO THE USER(S) OF THIS MATERIAL OR PRODUCT - IT IS NOT INTENDED TO SERVE AS A COMPREHENSIVE DISCUSSION OF ALL POSSIBLE RISKS OF HAZARDS, BUT RATHER PROVIDES INFORMATION GENERALLY ACCEPTED IN THE SCIENTIFIC COMMUNITY AS RELEVANT REGARDING THE POTENTIAL HAZARDS OF THIS PRODUCT. ADEQUATE TRAINING, INSTRUCTION, WARNINGS AND SAFE HANDLING PROCEDURES SHOULD BE PROVIDED TO HANDLERS AND USERS. USERS SHOULD REVIEW THE INFORMATION IN THE SDS, AND SATISFY THEMSELVES AS TO ITS SUITABILITY AND COMPLETENESS, INCLUDING ENSURING THAT THIS IS THE MOST CURRENT SDS.

Revision information

Product and Company Identification: Product and Company Identification
Composition / Information on Ingredients: Disclosure Overrides
First-aid measures: Most important symptoms/effects, acute and delayed
Accidental release measures: Methods and materials for containment and cleaning up
Physical & Chemical Properties: Multiple Properties
Stability and reactivity: Reactivity
Toxicological information: Symptoms related to the physical, chemical and toxicological characteristics
Disposal considerations: Local disposal regulations
Transport Information: Agency Name, Packaging Type, and Transport Mode Selection
Regulatory Information: United States
Regulatory information: California Prop 65

Completed by

Flint Hills Resources, LP - Operations EH&S