

1. IDENTIFICATION

Product Identifier Butane

Synonyms: Commercial Grade Butane; Liquefied Petroleum Gas; Mixed Butane; Non-Commercial Grade Butane

Intended use of the product: Fuel

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2. HAZARD IDENTIFICATION

According to OSHA 29 CFR 1910.1200 HCS

Classification of the Substance or Mixture

Classification (GHS-US):		
Flam. Gas	Category 1	H220
Compressed gas		H280
Simple Asphyxiant		

Labeling Elements



Signal Word (GHS-US):

Hazard Statements (GHS-US):

Danger

H220 - Extremely flammable gas.

H280 - Contains gas under pressure; may explode if heated.

May displace oxygen and cause rapid suffocation.

Precautionary Statements (GHS-US):

P210 - Keep away from heat, open flames, hot surfaces, sparks. - No smoking.
P271+403 – Use and Store only outdoors or in a well-ventilated place
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.
P410+P403 – Protect from sunlight. Store in a well-ventilated place.
P501 – Dispose of contents/container according to local, regional, national, and international regulations.

Other information:

NFPA 704

Health: 1

Fire: 4

Reactivity: 0



3. COMPOSITION / INFORMATION ON INGREDIENTS

Chemical Composition Information

Mixture

Name	Product Identifier (CAS#)	% (w/w)	Classification
Butane	106-97-8 and 75-28-5	85 - 100	Simple Asphy; Flam Gas 1, H220; Compressed gas, H280
Propylene	115-07-1	<5	Simple Asphy; Flam Gas 1, H220; Compressed gas, H280
Propane	74-98-6	<1.5	Simple Asphy; Flam Gas 1, H220; Compressed gas, H280
Pentane	109-66-0	0 - 3	Flam Liq 2, H225; STOT SE 3, H336; Asp Tox 1, H304; Aquatic Chronic 2, H411

4. FIRST AID MEASURES

Route	Measures
Inhalation	Move person to fresh air and seek medical attention. If person is not breathing, provide artificial respiration. Provide additional oxygen once breathing is restored if trained.
Ingestion	This material is a gas under normal atmospheric conditions and ingestion is unlikely. Risk of ingestion is extremely low. However, if oral exposure occurs do not induce vomiting. Seek medical attention.
Eye Contact	If injury is due to pressure, treat abrasions/contusions symptomatically. In case of freeze burn cover eyes to protect from light and then seek medical attention.
Skin Contact	If injury is due to pressure, treat abrasions/contusions symptomatically. Remove contaminated clothing. In case of blistering, frostbite or freeze burns seek immediate medical attention.

Most Important Symptoms

Simple asphyxiants are inert gases or vapors that displace oxygen from the air, primarily in enclosed spaces, and, thus, result in hypoxia. Dermal exposure may cause frostbite.

Immediate Medical Attention and Special Treatment

If prolonged exposure or hypoxia is suspected, provide ventilation and oxygenation and administer 100% humidified supplemental oxygen with assisted ventilation, as required. Rewarm or use topical treatment for frostbite injury. If eyes were exposed, irrigate with copious amounts of room temperature water for at least 15 minutes and seek medical attention.

5. FIRE-FIGHTING MEASURES

Extinguishing Media

Any extinguisher suitable for Class B fires, dry chemical, CO2, water spray, firefighting foam, or Halon. However, fires should not be extinguished unless flow of gas can be immediately stopped.

Specific Hazards / Products of Combustion

Evacuate area. Stay upwind. Butane is an explosion hazard and causes a dangerous fire when vapors are ignited from heat, spark, open flame or other source of ignition. Butane is heavier than air and may travel long distances to a point of ignition and flash back. Container may explode in heat or fire. Butane releases flammable gas at well below ambient temperatures and readily forms a flammable mixture with air.

Combustion may produce carbon monoxide and other products of incomplete combustion.

Special Precautions and Protective Equipment for Firefighters

If a leak has not ignited, use water spray to contain the vapors and to protect personnel attempting to stop the leak.

Boiling cryogenic liquids confined to tanks or containers exposed to fire could cause a boiling liquid expanding vapor explosion (BLEVE)

Gas and liquid are odorless. A combustible gas indicator should be used in the event of a release to determine if a flammable

atmosphere is present.

For fires in enclosed/confined areas, a self-contained breathing apparatus (SCBA) must be worn.

Unless creating a greater hazard, gas fires should not be extinguished. Re-accumulation of gas can result in an explosion. Fire impingement on surfaces (especially if the fire has been ongoing for a long period of time) could create sufficient heat to reignite product.

Fire Fighting Equipment/Instructions

Gas fires should not be extinguished unless flow of gas can be immediately stopped. Use water spray to protect personnel attempting to shut off gas source. Allow gas to burn out. Use water to cool equipment, surfaces and containers exposed to fire and excessive heat to prevent BLEVE. Remove combustible materials from immediate area if it can be done so safely. 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. Let vessel, tank car or container burn unless leak can be stopped. Stay away from the ends of tanks and transports. 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.

Firefighting activities that may result in potential exposure to high heat, smoke or toxic by-products of combustion should require NIOSH- approved pressure-demand self-contained breathing apparatus with full face piece and protective clothing.

Refer to Section 9 for fire properties of this chemical including flash point, auto ignition temperature, and explosive limits.

6. ACCIDENTAL RELEASE MEASURES**Personal Precautions**

Do not touch if in a liquid state as it is a frost bite/freeze burn hazard. Avoid all contact with skin, eyes, or clothing. Avoid breathing gas. Use special care to avoid static electric charges. Eliminate every possible source of ignition. Keep away from heat, sparks, open flames and hot surfaces.

Use appropriate personal protective equipment to prevent skin and eye contact. Use of NIOSH approved Self-Contained Breathing Apparatus may be necessary due to oxygen displacement. Direct reading air monitoring for oxygen and combustible gasses should be used during release response. Product is odorless which can result in unrecognized accumulation of flammable vapors without direct reading instruments.

Emergency Measures

Evacuate nonessential personnel and 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. Vapor cloud may be white, but color will dissipate as cloud disperses - fire and explosion hazard is still present. Releases indoors should be controlled remotely from a safe area. All personnel should evacuate interior locations using great care not to generate ignition sources. Product is heavier than air. Passive ventilation may be used to dilute gas concentrations to prevent an explosive atmosphere.

Environmental Precautions

Do not flush down sewer or drainage systems if in a liquid state.

Containment and Clean-Up Methods

Stop the source of the release, if safe to do so. Use a water spray to control vapors while personnel attempt to shut off source from a distance. Due the potential for fire or explosion from accumulation of vapors, spills or releases of this product should not be contained. Diversionary structures may be used to keep out of low lying areas, catch basins, culverts, and water bodies. Product should not be flushed or sprayed with water in a liquid state. Firefighting foam is not an effective knock-down agent for this product. Water fog sprayed into the air as a mist may be used as a capable knock-down agent. By forced ventilation, maintain concentration of gas below the range of explosive mixture. Remove the tank or cylinder to an open area if this can be done safely without generating an ignition source. Leave to bleed off in the atmosphere.

Response and cleanup crews must be properly trained and must utilize proper protective equipment.

Refer to Section 8 for additional information, cleanup methods, and environmental precautions.

7. HANDLING AND STORAGE**Handling Precautions**

Handle as a flammable gas. Keep away from heat, sparks, and open flame. No smoking. Electrical equipment should be

approved for classified areas. Bond and ground containers during product transfer pursuant to NFPA 52, NFPA 58, NFPA 70 and API RP 2003 to reduce the possibility of static-initiated fire or explosion. Use only in well ventilated areas. Product can displace oxygen at high concentrations. Do not enter confined spaces where product may be present. Test all confined spaces where product may accumulate for the presence of oxygen and combustible vapors.

Storage

Compressed gases may be stored in the open only if they are adequately protected from the weather and direct sunlight. Storage areas should be located at a safe distance from occupied premises and neighboring dwellings. Protect against physical damage. Outdoor or detached storage is preferred. Store in cool, well ventilated place and isolate from oxidizing agents. Prohibit open flame/smoking. Keep away from flame, sparks, excessive temperatures and open flame. Inspect for leakage occasionally. Check local fire codes and requirements for storage limitations / prohibitions indoors. Outdoor storage is recommended. Keep containers out of direct sunlight and exposed to temperatures in excess of 125 °F.

Only qualified personnel with approved dispensing equipment may load / or unload this product. Keep containers closed and clearly labeled. Store / transfer only into approved containers. Label all secondary containers that this material is transferred into with the chemical name and associated hazard(s). Empty product containers or vessels may contain explosive vapors. Do not pressurize, cut, heat, weld or expose such containers to sources of ignition. Post "No Smoking" signs in product handling and storage areas.

Incompatibles

Keep away from strong oxidizers, ignition sources and heat.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational Exposure Limits

Component	CAS #	List	Value
Butane	106-97-8 and 75-28-5	ACGIH STEL	1000 ppm
Propylene	115-07-1	ACGIH TLV-TWA	500 ppm
Propane	74-98-6	ACGIH TLV-TWA OSHA PEL	SA* 1000 ppm
Pentane	109-66-0	ACGIH TLV-TWA OSHA PEL	1000 ppm 1000 ppm

SA: Simple Asphyxiant. Significant quantities of component may displace oxygen, which is the limiting factor for exposure. See Appendix F of ACGIH Threshold Limit Values for Chemical Substances and Physical Agents for more information.

Engineering Controls

Product should only be stored and conveyed in equipment and using materials specifically designed for gas service. Systems should be designed and installed by qualified personnel. Use adequate ventilation to keep vapor concentrations of this product below occupational exposure and lower flammable limits. Do not vent indoors or other confined areas. If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure or explosive limits, additional engineering controls may be required.

Intrinsically safe equipment and non-sparking tools shall be used in circumstances where concentrations may exceed lower flammable limits. Grounding and bonding shall be used to prevent accumulation and discharge of static electricity.

Personal Protective Equipment

Exposure	Equipment
Eye / Face	Safety glasses and face shield should be used to minimize potential injury on contact with pressurized gas.
Skin	Use cold-impervious, insulating gloves where contact with pressurized gas may occur. The use of skin protection is not normally required. It is always good industrial hygiene practice to use gloves and apron when working with cryogenic liquid. Clothing and shoes should be static dissipative and fire resistant when dispensing large quantities of product with a potential for concentrations to exceed lower flammable limits during routine operations or reasonably foreseeable malfunctions or emergencies.

Exposure	Equipment
Respiratory	Use a NIOSH approved self-contained breathing apparatus (SCBA), respirator or equivalent in a pressure demand or other positive pressure. It should be used in situations of oxygen deficiency (oxygen content less than 19.5%) or unknown exposure concentrations. 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 and limitations. CAUTION: Flammability limits (i.e., explosion hazard) should be considered when assessing the need to expose personnel to concentrations requiring respiratory protection.
Thermal	Liquid is cryogenic. Use impervious face shield, garments or apron if contact with liquid is anticipated. Wear loose fitting insulated gloves.

Primary hazard of this product is storage at pressure, asphyxiation and fire. Personal protective equipment is not an effective control for physical hazards. These hazards should be recognized and avoided when encountered.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Value	Comments
Appearance	Colorless gas	
Odor	Odorless	
Odor Threshold	N/A	
pH	Not applicable	
Melting Point	-216 °F (-138 °C)	
Boiling Point Range	31 °F (-0.5 °C)	
Flash Point	-76 °F (-60 °C)	
Evaporation Rate	Not applicable	
Flammability	Flammable Gas	
Flammable Limits	1.9% - 8.5% by volume	
Vapor Pressure	207 KPa @ 70 °F (21 °C)	
Vapor Density	2 (air = 1)	
Material Density	Not applicable	
Solubility	very slight	
Partition Coefficient (N-octanol/water)	Not applicable	
Autoignition Temperature	550°F (287 °C)	
Decomposition Temperature	Evaporation or ignition likely before decomposition will occur	
Viscosity	Not applicable	
Percent Volatiles	100%	

10. STABILITY AND REACTIVITY

Stability

Stable under normal ambient and anticipated conditions of use.

Reactivity

Avoid all possible sources of ignition. Heat will increase pressure in the storage tank.

Possibility of Hazardous Reactions

Hazardous polymerization will not occur.

Incompatibility

Strong oxidizers.

Conditions to Avoid

High temperatures, open flames, sparks, welding, smoking, all ignition sources.

Hazardous Decomposition Products

Not anticipated under normal conditions of use. Byproducts of combustion include oxides of nitrogen, carbon dioxide, carbon monoxide.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Acute Toxicity (Inhalation LC50)

Propane (74-98-6)

LC50 Inhalation Rat 658 mg/l/4h (IUCLID)

Butane (106-97-8)

LC50 Inhalation Rat 658 mg/l/4h (HSDB)

Pentane (109-66-0)

LC50 Inhalation Rat 364 g/m3/4h (IUCLID)

Propylene (115-07-1)

LC50 inhalation Rat 658 mg/l/4h (IUCLID)

Acute Toxicity (Dermal LC50)

Pentane (109-66-0)

LD50 Dermal Rabbit 3000 mg/kg (IUCLID)

Skin Corrosion/Irritation: Not classified

Serious Eye Damage/Irritation: Not classified

Respiratory or Skin Sensitization: Not classified

Germ Cell Mutagenicity: Not classified

Teratogenicity: Not available

Carcinogenicity: OSHA: NO IARC: NO NTP: NO ACGIH: NO

Reproductive Toxicity: Not classified

Specific Target Organ Toxicity (Repeated Exposure): Not classified

Specific Target Organ Toxicity (Single Exposure): Not classified

Aspiration Hazard: Not classified

Exposure Routes: Inhalation at high concentrations in confined spaces with less than 16% oxygen needed to sustain life, skin and /or eye contact (liquid).

Symptoms: Include dizziness, headache, confusion, excitation, vomiting, asphyxia, liquid frostbite.

12. ECOLOGICAL INFORMATION

Toxicity

Harmful to aquatic life.

Data for Component: Pentane (109-66-0):

Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

LC50 Fish 1	9.87 mg/l (Exposure time: 96 h - Species: Oncorhynchus mykiss)
EC50 Daphnia 1	9.74 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	11.59 mg/l (Exposure time: 96 h - Species: Pimephales promelas)

Persistence and Degradation: Not available

Bioaccumulative Potential: Not expected based on volatile nature of material.

Propane (74-98-6)	
Log Kow	2.3
Butane (106-97-8)	
Log Kow	2.8
Pentane (109-66-0)	
Log Kow	3.39
Propylene (115-07-1)	
Log Kow	1.77

Mobility in Soil: Not available

Other Adverse Effects: None

Other Information: Avoid release to the environment.

13. DISPOSAL CONSIDERATIONS

This product is a gas and typically would not be managed as a waste. If necessary, allow to dissipate to the atmosphere (if permitted by federal/provincial/municipal requirements). Dispose in a safe location, preferably by burning with a flare. If disposal of butane cannot be flared, care must be taken to ensure complete dissipation of the gas to a concentration below its flammable limits. Recycle any unused portion of the material for its approved use or return it to the manufacturer or supplier.

14. TRANSPORT INFORMATION

US DOT

UN Identification Number	UN1075
Proper Shipping Name	Liquefied petroleum gas (butane)
Hazard Class and Packing Group	2.1
Shipping Label	Flammable Gas
Placard / Bulk Package	Flammable Gas / UN 1011
Emergency Response Guidebook Guide Number	115

IATA Cargo

UN Identification Number	Forbidden
Proper Shipping Name	Forbidden
Hazard Class and Packing Group	Forbidden
ICA Label	NA
Packing Instructions Cargo	Forbidden
Emergency Response Guidebook Guide Number	Forbidden

IATA Passenger

UN Identification Number	Forbidden
Shipping Name / Description	Forbidden
Hazard Class and Packing Group	Forbidden

ICAO Label	NA
Packing Instructions	Forbidden
Max Quantity per Package	Forbidden

IMDG

UN Identification Number	UN1011
Shipping Name / Description	Butane
Hazard Class and Packing Group	2.1
IMDG Label	2.1
EmS Number	P200
Marine Pollutant	No

If this product is placed into pressurized containers and offered for shipment, please refer to 49 CFR 171.304, 306, and 314 and 315 for appropriate regulatory information.

15. REGULATORY INFORMATION

U.S. Federal, State, and Local Regulatory Information

Any spill or uncontrolled release of this product, including any substantial threat of release, may be subject to federal, state and/or local reporting requirements. This product and/or its constituents may also be subject to other federal, state, or local regulations; consult those regulations applicable to your facility/operation.

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	Yes
Reactive Hazard	No
Sudden Release of Pressure Hazard	Yes
Simple asphyxiant	

Clean Water Act (Oil Spills)

No components listed.

CERCLA Section 103 and SARA Section 304 (Release to the Environment)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts this material. This product does not contain any chemicals subject to the reporting requirements of CERCLA Section 103 or SARA 304.

SARA Section 313- Supplier Notification

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

Component	CAS	Amount
Propylene	115-07-1	<5%

Pennsylvania Right to Know Hazardous Substance list:

The following product components are cited in the Pennsylvania Special Hazardous Substance List, and are present at levels which require reporting.

Component	CAS	Amount
Butane	106-97-8	85-100%
Propylene	115-07-1	<5%
Propane	74-98-6	<1.5%
Pentane	109-66-0	<1%

New Jersey Right to Know Hazardous Substance list:

The following product components are cited in the New Jersey Right to Know Hazardous Substance List and are present at levels which require reporting.

Component	CAS	Amount
Butane	106-97-8	85-100%
Propylene	115-07-1	<5%
Propane	74-98-6	<1.5%
Pentane	109-66-0	<1%

California Proposition 65

This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

U.S. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30.

CEPA - Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Canadian Regulatory Information (WHMIS)

Class A - Compressed Gas
Class B1 - Flammable Gases

16. OTHER INFORMATION

Version 5
Issue Date June 1, 2021
Prior Issue Date May 20, 2016

Description of Revisions

Update to occupational exposure limit information in Section 8. No changes to hazard information or chemical constituents.

Abbreviations

°F	Degrees Fahrenheit (temperature)	mL	Milliliter
<	Less than	mm ²	Square millimeters
=	Equal to	mmHg	Millimeters of mercury (pressure)
>	Greater than	N/A	Not applicable
AP	Approximately	N/D	Not determined
C	Centigrade (temperature)	ppm	Parts per million
kg	Kilogram	sec	Second
L	Liter	ug	Micrograms
mg	Milligrams		

Acronyms

ACGIH	American Conference of Governmental Industrial Hygienists	CERCLA	Comprehensive Emergency Response, Compensation, and Liability Act
AIHA	American Industrial Hygiene Association	DOT	U.S. Department of Transportation
AL	Action Level	EC50	Ecological concentration 50%
ANSI	American National Standards Institute	EPA	U.S. Environmental Protection Agency
API	American Petroleum Institute	ERPG	Emergency Response Planning Guideline
CAS	Chemical Abstract Service	GHS	Global Harmonized System

HMIS	Hazardous Materials Information System	RVP	Reid Vapor Pressure
IARC	International Agency for Research On Cancer	SA	Simple Asphyxiant
IATA	International Air Transport Association	SARA	Superfund Amendments and Reauthorization Act of 1986 Title III
IMDG	International Maritime Dangerous Goods	SCBA	Self Contained Breathing Apparatus
Koc	Soil Organic Carbon	SPCC	Spill Prevention, Control, and Countermeasures
LC50	Lethal concentration 50%	STEL	Short Term Exposure Limit (generally 15 minutes)
LD50	Lethal dose 50%	TLV	Threshold Limit Value (ACGIH)
MSHA	Mine Safety and Health Administration	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average (8 hr.)
NIOSH	National Institute of Occupational Safety and Health	UN	United Nations
NOIC	Notice of Intended Change	UNECE	United Nations Economic Commission for Europe
NTP	National Toxicology Program	WEEL	Workplace Environmental Exposure Level (AIHA)
OPA	Oil Pollution Act of 1990	WHMIS	Canadian Workplace Hazardous Materials Information System
OSHA	U.S. Occupational Safety & Health Administration		
PEL	Permissible Exposure Limit (OSHA)		
RCRA	Resource Conservation and Recovery Act		
REL	Recommended Exposure Limit (NIOSH)		

Disclaimer of Expressed and Implied Warranties

Information presented herein has been compiled from sources considered to be dependable and is accurate and reliable to the best of our knowledge and belief but is not guaranteed to be so. Since conditions of use are beyond our control, we make no warranties, expressed or implied, except those that may be contained in our written contract of sale or acknowledgment.

Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, vendor assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material, even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in their use of the material.

**** End of Safety Data Sheet ****