

EMERGENCY OVERVIEW

DANGER!
EXTREMELY FLAMMABLE GAS - MAY CAUSE FLASH FIRE OR EXPLOSION! -
COMPRESSED GAS - CONTACT WITH LIQUID CAN CAUSE FROSTBITE OR FREEZE BURN



NFPA 704 (Section 16)

High concentrations may exclude oxygen and cause dizziness and suffocation.
Contact with liquid or cold vapor may cause frostbite or freeze burn.

1. CHEMICAL PRODUCT and COMPANY INFORMATION

HOVENSA LLC
1 Estate Hope
Christiansted, VI 00820

EMERGENCY TELEPHONE NUMBER (24 hrs): CHEMTREC (800) 424-9300

COMPANY CONTACT (business hours): 340-692-3000

SYNONYMS: Butanes, Commercial Butane, Liquefied Butane, iso-butane, mixed butanes, normal butane, n-butane.

See Section 16 for abbreviations and acronyms.

2. COMPOSITION and INFORMATION ON INGREDIENTS

INGREDIENT NAME (CAS No.)	CONCENTRATION PERCENT BY WEIGHT
Normal butane (n-butane) (106-97-8)	0 - 100
Iso-butane (75-28-5)	0 - 100
Butylene (butene) (25167-67-3)	< balance >

Butane consists of two isomers, n-butane (CH₃CH₂CH₂CH₃) and iso-butane [(CH₃)₃CH]. Both isomers may be isolated separately, or can be available as a mixture. Both isomers exhibits similar hazards and are grouped as "butane." Butylene (C₄H₈) may be present, depending on the source.

3. HAZARDS IDENTIFICATION

EYES

Vapors are not irritating. However, contact with liquid or cold vapor may cause frostbite, freeze burns, and permanent eye damage

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. Signs of frostbite include a change in the color of the skin to gray or white, possibly followed by blistering. Skin may become inflamed and painful.

INGESTION

Ingestion is unlikely. Contact with mucous membranes with liquefied product may cause frostbite and freeze burns.

INHALATION

This product is considered to be non-toxic by inhalation. Inhalation of concentrations of about 10,000 ppm may cause central nervous system depression such as dizziness, drowsiness, headache, and similar narcotic symptoms, but no long-term effects.



MATERIAL SAFETY DATA SHEET

Butane

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This product is a simple asphyxiant. In high concentrations it 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.

WARNING: The burning of 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.

CHRONIC and CARCINOGENICITY

None expected - see Section 11.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Individuals with pre-existing conditions of the heart, lungs, and blood may have increased susceptibility to symptoms of asphyxia. Butane may hypersensitize the heart to ventricular fibrillation and arrhythmias in people taking epinephrine.

4. FIRST AID MEASURES

EYES

In case of contact with eyes, hold eyelids open to allow liquid to evaporate. Cover eyes to protect from light. Seek immediate medical attention.

SKIN

Remove contaminated clothing. In case of frostbite or freeze burns seek immediate medical attention.

INGESTION

Risk of ingestion is extremely low. However, if oral exposure occurs, seek immediate medical assistance.

INHALATION

Remove person to fresh air. If person is not breathing, provide artificial respiration. If necessary, provide additional oxygen once breathing is restored if trained to do so. Seek medical attention immediately.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

	<u>iso-butane</u>	<u>n-butane</u>
FLASH POINT:	-112.3 °F (-80 °C)	-76 °F (-69 °C)
AUTOIGNITION POINT:	550 °F (287 °C)	550 °F (287 °C)
OSHA/NFPA FLAMMABILITY CLASS:	FLAMMABLE GAS	FLAMMABLE GAS
LOWER EXPLOSIVE LIMIT (%):	1.6	1.6
UPPER EXPLOSIVE LIMIT (%):	8.4	8.4

FIRE AND EXPLOSION HAZARDS

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. Runoff to sewer may cause fire or explosion hazard.

EXTINGUISHING MEDIA

Dry chemical, carbon dioxide, Halon or water. However, fire should not be extinguished unless flow of gas can be immediately stopped.

FIRE FIGHTING INSTRUCTIONS



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Gas fires should not be extinguished unless flow of gas can be immediately stopped. Shut off gas source and allow gas to burn out. If spill or leak has not ignited, determine if water spray may assist in dispersing gas or vapor to protect personnel attempting to stop 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.

Isolate area, particularly around ends of storage vessels. Let vessel, tank car or container burn unless leak can be stopped. 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/MSHA- approved pressure-demand self-contained breathing apparatus with full facepiece and full protective clothing.

See Section 16 for NFPA 704 Hazard Rating.

6. ACCIDENTAL RELEASE MEASURES

ACTIVATE FACILITY'S SPILL CONTINGENCY or EMERGENCY RESPONSE PLAN.

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!

Stop the source of the release, if safe to do so. Do not flush down sewer or drainage systems. Do not touch spilled liquid (frostbite/freeze burn hazard!). Consider the use of water spray to disperse vapors. Isolate the area until gas has dispersed. Ventilate and gas test area before entering.

7. HANDLING and STORAGE

HANDLING PRECAUTIONS

Keep away from flame, sparks and excessive temperatures. Bond and ground containers. Use only in well ventilated areas. 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.

STORAGE PRECAUTIONS

Keep away from flame, sparks and excessive temperatures. Store only in approved containers.

WORK/HYGIENIC PRACTICES

Emergency eye wash capability should be available in the near proximity to operations presenting a potential splash exposure. Use good personal hygiene practices. Avoid repeated and/or prolonged skin exposure. Wash hands before eating, drinking, smoking, or using toilet facilities. Do not use as a cleaning solvent or harsh abrasive skin cleaners for washing this product from exposed skin areas. Waterless hand cleaners are effective. Promptly remove contaminated clothing and launder before reuse. Use care when laundering to prevent the formation of flammable vapors which could ignite via washer or dryer. Consider the need to discard contaminated leather shoes and gloves.

8. EXPOSURE CONTROLS and PERSONAL PROTECTION

EXPOSURE LIMITS

Components (CAS No.)	Source	Exposure Limits	
		TWA/STEL	Note
Normal butane (n-butane) (106-97-8)	OSHA	None established	
	ACGIH	1000 ppm as Aliphatic Hydrocarbon Gases	
Iso-butane (75-28-5)	OSHA	None established	



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Components (CAS No.)	Source	Exposure Limits	Note
		TWA/STEL	
Butylene (butene) (25167-67-3)	ACGIH	1000 ppm as Aliphatic Hydrocarbon Gases	
	OSHA	None established – simple asphyxiant	
	ACGIH	None established – simple asphyxiant	

ENGINEERING CONTROLS

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/FACE PROTECTION

Safety glasses or goggles are recommended where there is a possibility of splashing or spraying.

SKIN PROTECTION

Where contact with liquid may occur, wear apron, faceshield, and cold-impervious, insulating gloves.

RESPIRATORY PROTECTION

Use a NIOSH/MSHA approved positive-pressure, supplied air respirator with escape bottle or self-contained breathing apparatus (SCBA) for gas concentrations above occupational exposure limits, for potential for uncontrolled release, if exposure levels are not known, or in an oxygen-deficient atmosphere. 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.

CAUTION: Flammability limits (i.e., explosion hazard) should be considered when assessing the need to expose personnel to concentrations requiring respiratory protection.

9. PHYSICAL and CHEMICAL PROPERTIES

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

Faint, gasoline-like odor. Odor threshold is approximately 2700 ppm.

BASIC PHYSICAL PROPERTIES

	<u>Iso-butane</u>	<u>n-butane</u>
BOILING POINT:	10.9 °F (-11.7 °C) @ 1 atm.	31.1 °F (-0.5 °C) @ 1 atm.
VAPOR PRESSURE:	30.58 psig @ 70 °F (21.1 °C)	16.54 psig @ 70 °F (21.1 °C)
SPECIFIC GRAV. OF GAS (air = 1):	2.01 @ 32 °F (0 °C) @ 1 atm.	2.01 @ 70 °F (21 °C) @ 1 atm.
PERCENT VOLATILES:	100	100
SOLUBILITY (H ₂ O):	Not soluble	Not soluble

10. STABILITY and REACTIVITY

STABILITY: Stable. Hazardous polymerization will not occur

CONDITIONS TO AVOID and INCOMPATIBLE MATERIALS

Keep away from strong oxidizers, ignition sources and heat. Explosion hazard when exposed to nickel carbonyl/oxygen mixture.

HAZARDOUS DECOMPOSITION PRODUCTS

Carbon monoxide, carbon dioxide and non-combusted hydrocarbons (smoke).

11. TOXICOLOGICAL PROPERTIES

ACUTE TOXICITY



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Normal butane and isobutane exhibit some degree of anesthetic action and, in the dog, are cardiac sensitizers at high concentrations. At high concentrations, butanes/butylenes are simple asphyxiants – see Section 3.

Acute inhalation LC(50): 658 mg/l (270,000 ppm) butane (4 hour-rat); 52 mg/l (22,000 ppm) isobutane (1 hour-mouse)

CHRONIC EFFECTS AND CARCINOGENICITY

None expected; simple asphyxiant.

Carcinogenic: **IARC: NO** **NTP: NO** **OSHA: NO** **ACGIH: NO**

12. 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.

13. DISPOSAL CONSIDERATIONS

Consult federal, state and local waste regulations to determine appropriate disposal options.

14. TRANSPORTATION INFORMATION

PROPER SHIPPING NAME:	Butane	Petroleum Gases, Liquefied
HAZARD CLASS:	2.1	2.1
DOT IDENTIFICATION NUMBER:	UN 1011	UN 1075
DOT SHIPPING LABEL:	FLAMMABLE GAS	FLAMMABLE GAS
PLACARD:		

15. REGULATORY INFORMATION

U.S. FEDERAL, STATE, and LOCAL REGULATORY INFORMATION

This product and its constituents listed herein are on the EPA TSCA Inventory.

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 regulations at the federal, state and/or local level. Consult those regulations applicable to your facility/operation.

CERCLA SECTION 103 and SARA SECTION 304 (RELEASE TO THE ENVIRONMENT)

The CERCLA definition of hazardous substances contains a "petroleum exclusion" clause which exempts natural gas and synthetic gas usable for fuel and any indigenous components of such from the CERCLA Section 103 reporting requirements. However, other federal reporting requirements, including SARA Section 304, may still apply.

SARA SECTION 311/312 - HAZARD CLASSES

<u>ACUTE HEALTH</u>	<u>CHRONIC HEALTH</u>	<u>FIRE</u>	<u>SUDDEN RELEASE OF PRESSURE</u>	<u>REACTIVE</u>
--	--	X	X	--

SARA SECTION 313 - SUPPLIER NOTIFICATION

This product does not contain 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.

CALIFORNIA PROPOSITION 65 LIST OF CHEMICALS



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This product does not contain chemicals that are included on the Proposition 65 "List of Chemicals" required by the California Safe Drinking Water and Toxic Enforcement Act of 1986:

CANADIAN REGULATORY INFORMATION (WHMIS)

Class A (Compressed Gas) Class B, Division 1 (Flammable Gas)

16. OTHER INFORMATION

NFPA® HAZARD RATING HEALTH: 1 Slight
FIRE: 4 Extreme
REACTIVITY: 0 Negligible

HMIS® HAZARD RATING HEALTH: 1 Slight
FIRE: 4 Extreme
PHYSICAL: 0 Negligible

SUPERSEDES MSDS DATED: 02/29/00

ABBREVIATIONS:

AP = Approximately < = Less than > = Greater than
N/A = Not Applicable N/D = Not Determined ppm = parts per million

ACRONYMS:

ACGIH American Conference of Governmental Industrial Hygienists
AIHA American Industrial Hygiene Association
ANSI American National Standards Institute (212) 642-4900
API American Petroleum Institute (202) 682-8000
CERCLA Comprehensive Emergency Response, Compensation, and Liability Act
DOT U.S. Department of Transportation [General info: (800) 467-4922]
EPA U.S. Environmental Protection Agency
HMIS Hazardous Materials Information System
IARC International Agency For Research On Cancer
MSHA Mine Safety and Health Administration
NFPA National Fire Protection Association (617) 770-3000
NIOSH National Institute of Occupational Safety and Health
NOIC Notice of Intended Change (proposed change to ACGIH TLV)
NTP National Toxicology Program
OPA Oil Pollution Act of 1990
OSHA U.S. Occupational Safety & Health Administration
PEL Permissible Exposure Limit (OSHA)
RCRA Resource Conservation and Recovery Act
REL Recommended Exposure Limit (NIOSH)
SARA Superfund Amendments and Reauthorization Act of 1986 Title III
SCBA Self-Contained Breathing Apparatus
SPCC Spill Prevention, Control, and Countermeasures
STEL Short-Term Exposure Limit (generally 15 minutes)
TLV Threshold Limit Value (ACGIH)
TSCA Toxic Substances Control Act
TWA Time Weighted Average (8 hr.)
WEEL Workplace Environmental Exposure Level (AIHA)
WHMIS Canadian Workplace Hazardous Materials Information System

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