




SAFETY DATA SHEET

1. Identification

Product identifier	Butane
Other means of identification	
SDS number	303 - GHS
Synonyms	Butane, Normal Butane, n-Butane, Commercial Butane, Mixed Butane, Natural Butane.
Recommended use	This product is intended for use as a refinery feedstock, fuel or for use in engineered processes. Use in other applications may result in higher exposures and require additional controls, such as local exhaust ventilation and personal protective equipment.
Recommended restrictions	None known.
Manufacturer/Importer/Supplier/Distributor information	
Manufacturer/Supplier	Valero Marketing & Supply Company and Affiliates One Valero Way San Antonio, TX 78269-6000 210-345-4593
General Assistance	210-345-4593
E-Mail	CorpHSE@valero.com
Contact Person	Industrial Hygienist
Emergency Telephone	24 Hour Emergency 866-565-5220 1-800-424-9300 (CHEMTREC USA)

2. Hazard(s) identification

Physical hazards	Flammable gases	Category 1
	Gases under pressure	Liquefied gas
Health hazards	Germ cell mutagenicity	Category 1B
	Carcinogenicity	Category 1A
OSHA defined hazards	Simple asphyxiant	
Label elements		

Signal word	Danger
Hazard statement	Contains gas under pressure; may explode if heated.
Precautionary statement	
Prevention	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/face protection.
Response	If exposed or concerned: Get medical advice/attention. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.
Storage	Store locked up. Protect from sunlight. Store in a well-ventilated place.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Butane	106-97-8	94 - 100
Isobutane	75-28-5	0 - 6

Butane

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Butylene	25167-67-3	0 - 1
1,3-butadiene	106-99-0	0 - 0.1

4. First-aid measures

Inhalation	Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Call a physician or poison control center immediately.
Skin contact	When high-pressure isobutane liquid is placed under reduced lower pressure, isobutane vaporizes to be cooled. Thus, skin contact with isobutane may cause frostbite. Wash frost-bitten areas with plenty of water. Do not remove clothing. Get medical attention immediately.
Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.
Ingestion	Ingestion is not a typical route of exposure for gases or liquefied gases.
Most important symptoms/effects, acute and delayed	Narcosis. Decrease in motor functions. Behavioral changes. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.
Indication of immediate medical attention and special treatment needed	Treat symptomatically.

5. Fire-fighting measures

Suitable extinguishing media	Dry chemical, CO ₂ , water spray, fog, or foam.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	Extremely flammable gas. Gases may form explosive mixtures with air. Vapors are heavier than air and may travel along the ground to some distant source of ignition and flash back.
Special protective equipment and precautions for firefighters	None known.
Fire-fighting equipment/instructions	Self-contained breathing apparatus, operated in positive pressure mode and full protective clothing must be worn in case of fire. Move container from fire area if it can be done without risk. Do not extinguish fires unless gas flow can be stopped safely; explosive re-ignition may occur. Promptly isolate the scene by removing all persons from the vicinity of the incident. No action shall be taken involving any personal risk or without suitable training. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus. Stop flow of material. Use water to keep fire exposed containers cool and to protect personnel effecting shutoff. If a leak or spill has not ignited, use water spray to disperse the vapors and to protect personnel attempting to stop leak. Prevent runoff from fire control or dilution from entering streams, sewers or drinking water supply.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Evacuate the area promptly. No action shall be taken involving any personal risk or without suitable training. Keep unnecessary personnel away.
Methods and materials for containment and cleaning up	Ensure adequate ventilation. In case of inadequate ventilation, use respiratory protection. Wear appropriate personal protective equipment (See Section 8). Ventilate well, stop flow of gas or liquid if possible. Immediately contact emergency personnel.
Environmental precautions	Should not be released into the environment. Prevent further leakage or spillage if safe to do so. Prevent from entering into soil, ditches, sanitary sewers, waterways and/or groundwater.

7. Handling and storage

Precautions for safe handling	Eliminate sources of ignition. Avoid spark promoters. Ground/bond container and equipment. These alone may be insufficient to remove static electricity. Wear appropriate personal protective equipment (See Section 8). Eating, drinking, and smoking should be prohibited in areas where this material is handled, stored, and processed. Do not breathe gas. Do not get in eyes, on skin, on clothing. Use only with adequate ventilation.
Conditions for safe storage, including any incompatibilities	Store in accordance with local, regional, national, and international regulations. Secure cylinders in an upright position at all times, close all valves when not in use. Store in a cool, dry, well-ventilated place. Keep container tightly closed and sealed until ready for use. Protect cylinders from damage.

8. Exposure controls/personal protection

Occupational exposure limits

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

Components	Type	Value
1,3-butadiene (CAS 106-99-0)	STEL	5 ppm
	TWA	1 ppm

US. ACGIH Threshold Limit Values

Material	Type	Value
Butane (CAS Mixture)	TWA	1000 ppm

Components	Type	Value
1,3-butadiene (CAS 106-99-0)	TWA	2 ppm
Butane (CAS 106-97-8)	STEL	1000 ppm
Butylene (CAS 25167-67-3)	TWA	250 ppm
Isobutane (CAS 75-28-5)	STEL	1000 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value
Butane (CAS Mixture)	REL	1900 mg/m3 800 ppm

Components	Type	Value
Butane (CAS 106-97-8)	TWA	1900 mg/m3 800 ppm
Isobutane (CAS 75-28-5)	TWA	1900 mg/m3 800 ppm

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
1,3-butadiene (CAS 106-99-0)	2.5 mg/l	1,2-Dihydroxy-4-(N-acetylcysteinyl)-butane	Urine	*
	2.5 pmol/g	Mixture of N-1- and N-2-(hydroxybutenyl)valine hemoglobin (Hb) adducts	Hemoglobin in blood	*

* - For sampling details, please see the source document.

Appropriate engineering controls Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits. The engineering controls also need to keep gas, vapor, or dust concentrations below any lower explosive limits.

Individual protection measures, such as personal protective equipment

Eye/face protection Wear approved safety glasses or goggles.

Skin protection

Hand protection Wear appropriate chemical resistant gloves.

Other Wear protective clothing appropriate for the risk of exposure.

Respiratory protection If engineering controls do not maintain airborne concentrations below recommended exposure limits (where applicable) or to an acceptable level (in countries where exposure limits have not been established), an approved respirator must be worn.

Thermal hazards Contact with liquefied gas might cause frostbites, in some cases with tissue damage. Wear appropriate thermal protective clothing, when necessary.

General hygiene considerations Do not eat, drink or smoke when using the product. Wash thoroughly after handling. Provide eyewash station and safety shower. Handle in accordance with good industrial hygiene and safety practices.

9. Physical and chemical properties

Appearance	Gas. Compressed liquefied gas.
Physical state	Gas.
Form	Not available.
Color	Colorless
Odor	Gasoline-like.
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	-266.35 °F (-165.75 °C) Weighted average
Initial boiling point and boiling range	Not available.
Flash point	-76.0 °F (-60.0 °C) Closed Cup (Butane)
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	1.9 % (Butane)
Flammability limit - upper (%)	8.5 % (Butane)
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	2 Air = 1
Relative density	0.57 (water=1) Weighted average
Solubility(ies)	
Solubility (water)	Insoluble in the cold water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Molecular formula	Mixture, not applicable
Percent volatile	Essentially 100%
VOC (Weight %)	100 %

10. Stability and reactivity

Reactivity	Not available.
Chemical stability	Stable under normal temperature conditions and recommended use.
Possibility of hazardous reactions	Polymerization will not occur.
Conditions to avoid	In a fire or if heated, a pressure increase will occur and the container may burst or explode.
Incompatible materials	Oxidizing agents. Reducing agents. Acids. Alkalis.
Hazardous decomposition products	No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

Ingestion	Not likely, due to the form of the product.
Inhalation	Breathing of high concentrations may cause dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness. Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.

Skin contact	Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.	
Eye contact	Contact with liquefied gas may cause frostbite.	
Symptoms related to the physical, chemical and toxicological characteristics	Narcosis. Behavioral changes. Decrease in motor functions.	
Information on toxicological effects		
Acute toxicity	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").	
Components	Species	Test Results
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1,3-butadiene (CAS 106-99-0)		
Acute		
<i>Inhalation</i>		
LC50	Rat	285 mg/l, 4 Hours
<i>Oral</i>		
LD50	Rat	5.48 g/kg
Skin corrosion/irritation	Contact with liquefied gas might cause frostbites, in some cases with tissue damage.	
Serious eye damage/eye irritation	Direct contact with liquefied gas may cause eye damage from frostbite.	
Respiratory or skin sensitization		
Respiratory sensitization	Based on available data, the classification criteria are not met.	
Skin sensitization	Not a skin sensitizer.	
Germ cell mutagenicity	May cause genetic defects.	
Carcinogenicity	May cause cancer.	
IARC Monographs. Overall Evaluation of Carcinogenicity		
1,3-butadiene (CAS 106-99-0)	1 Carcinogenic to humans.	
NTP Report on Carcinogens		
1,3-butadiene (CAS 106-99-0)	Known To Be Human Carcinogen.	
US. OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)		
1,3-butadiene (CAS 106-99-0)	Cancer	
Reproductive toxicity	Based on available data, the classification criteria are not met.	
Specific target organ toxicity - single exposure	Based on available data, the classification criteria are not met.	
Specific target organ toxicity - repeated exposure	Based on available data, the classification criteria are not met.	
Aspiration hazard	Based on available data, the classification criteria are not met.	
Chronic effects	May cause central nervous system effects. 1,3-Butadiene: Human Epidemiology studies suggest an association between exposure to 1,3-butadiene and development of cancer in humans. Several studies have indicated conflicting results regarding adverse reproductive and developmental effects in laboratory animals. While the overall evidence does not support a causal relationship for adverse reproductive effects in humans, these studies indicate that minimizing exposure to 1,3-butadiene would be an appropriate precaution.	
Further information	BUTANES: Studies in laboratory animals indicate exposure to extremely high levels of butanes (1-10 or higher vol-% in air) may cause cardiac arrhythmias (irregular heartbeats), which can be serious or fatal.	

12. Ecological information

Ecotoxicity	Not expected to be harmful to aquatic organisms.
Persistence and degradability	Not available.
Bioaccumulative potential	Not available.

Partition coefficient n-octanol / water (log Kow)

1,3-butadiene (CAS 106-99-0)	1.99
Butane (CAS 106-97-8)	2.89
Isobutane (CAS 75-28-5)	2.76

Mobility in soil	Not available.
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Other adverse effects Not available.

13. Disposal considerations

Disposal instructions Dispose in accordance with all applicable regulations. Empty containers may contain product residues. Do not puncture or incinerate even when empty. This material and/or its container must be disposed of as hazardous waste. Return the empty cylinder to the supplier.

Hazardous waste code D001: Waste Flammable material with a flash point <140 °F

Waste from residues / unused products Dispose of in accordance with local regulations.

Contaminated packaging Offer rinsed packaging material to local recycling facilities.

14. Transport information

DOT

UN number UN1011
UN proper shipping name Butane
Transport hazard class(es)
Class 2.1
Subsidiary risk -
Packing group Not applicable.
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Special provisions 19, T50
Packaging exceptions 306
Packaging non bulk 304
Packaging bulk 314, 315

IATA

UN number UN1011
UN proper shipping name Butane
Transport hazard class(es)
Class 2.1
Subsidiary risk -
Label(s) 2.1
Packing group Not applicable.
Environmental hazards No.
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

IMDG

UN number UN1011
UN proper shipping name Butane
Transport hazard class(es)
Class 2.1
Subsidiary risk -
Label(s) 2.1
Packing group Not applicable.
Environmental hazards
Marine pollutant No.
EmS Not available.
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable. This product is a compressed or liquefied gas and when transported in bulk is covered under IGC code.

15. Regulatory information

US federal regulations This product is hazardous according to OSHA 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

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

1,3-butadiene (CAS 106-99-0) Cancer
Eye irritation
Respiratory tract irritation
Central nervous system
Flammability

CERCLA Hazardous Substance List (40 CFR 302.4)

1,3-butadiene (CAS 106-99-0)	LISTED
Butane (CAS 106-97-8)	LISTED
Isobutane (CAS 75-28-5)	LISTED

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

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical	Yes
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SARA 313 (TRI reporting)

Not regulated.

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

1,3-butadiene (CAS 106-99-0)

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

1,3-butadiene (CAS 106-99-0)

Butane (CAS 106-97-8)

Isobutane (CAS 75-28-5)

Safe Drinking Water Act (SDWA)	Not regulated.
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US state regulations	WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.
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US. Massachusetts RTK - Substance List

1,3-butadiene (CAS 106-99-0)

Butane (CAS 106-97-8)

Isobutane (CAS 75-28-5)

US. New Jersey Worker and Community Right-to-Know Act

1,3-butadiene (CAS 106-99-0)

Butane (CAS 106-97-8)

Isobutane (CAS 75-28-5)

US. Pennsylvania Worker and Community Right-to-Know Law

1,3-butadiene (CAS 106-99-0)

Butane (CAS 106-97-8)

Isobutane (CAS 75-28-5)

US. Rhode Island RTK

1,3-butadiene (CAS 106-99-0)

Butane (CAS 106-97-8)

Isobutane (CAS 75-28-5)

US. California Proposition 65**US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance**

1,3-butadiene (CAS 106-99-0)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes

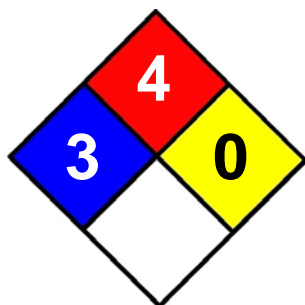
Country(s) or region	Inventory name	On inventory (yes/no)*
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

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

Issue date	13-August-2013
Revision date	23-May-2014
Version #	02
Further information	HMIS® is a registered trade and service mark of the NPCA.
NFPA Ratings	



References	EPA: AQUIRE database US. IARC Monographs on Occupational Exposures to Chemical Agents HSDB® - Hazardous Substances Data Bank National Toxicology Program (NTP) Report on Carcinogens ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices
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