



MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	Isobutane
Revision date	01-06-2012
Version #	01
CAS #	75-28-5
MSDS Number	305
Product 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.
Synonym(s)	i-Butane, iso-Butane
Manufacturer/Supplier	Valero Marketing & Supply Company and Affiliates P.O. Box 696000 San Antonio, TX 78269-6000
General Assistance	210-345-4593
Emergency	24 Hour Emergency 866-565-5220 1-800-424-9300 (CHEMTREC USA)

2. Hazards Identification

Physical state	Gas.
Appearance	Colorless liquefied gas.
Emergency overview	DANGER

Extremely flammable gas. High pressure gas. Gas reduces oxygen available for breathing.

Contact with liquefied gas might cause frostbites, in some cases with tissue damage. In a fire or if heated, a pressure increase will occur and the container may burst or explode. Contains 1,3-butadiene. Static accumulating flammable materials can become electrostatically charged even in bonded and grounded equipment. Sparks may ignite material and vapor may cause flash fire (or explosion).

OSHA regulatory status This product is hazardous according to OSHA 29 CFR 1910.1200.

Potential health effects

Routes of exposure

Eyes Inhalation. Eyes. Skin. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

Skin Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

Inhalation Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Nasal and respiratory tract irritation, central nervous system effects including excitation, euphoria, contracted eye pupils, dizziness, drowsiness, blurred vision, fatigue, nausea, headache, loss of reflexes, tremors, convulsions, seizures, loss of consciousness, coma, respiratory arrest and sudden death could occur as a result of long term and/or high concentration exposure to vapors. May also cause anemia and irregular heart rhythm.

Ingestion This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Target organs Respiratory tract. Eyes. Central nervous system.

Chronic effects May cause central nervous system effects. Components have been shown to be weak cardiac sensitizers which can result in cardiac arrhythmia and ventricular fibrillation. 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.

Potential environmental effects Not expected to be harmful to aquatic organisms.

3. Composition / Information on Ingredients

Components	CAS #	Percent
Isobutane	75-28-5	90 - 100
Butane	106-97-8	0 - 10
1,3-butadiene	106-99-0	0 - 0.1

4. First Aid Measures

First aid procedures

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.
Skin contact	Wash frost-bitten areas with plenty of water. Do not remove clothing. Get medical attention immediately.
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.
Ingestion	Ingestion is not a typical route of exposure for gases or liquefied gases.

Notes to physician Treat symptomatically.

5. Fire Fighting Measures

Flammable properties Flammable by OSHA criteria. Containers may explode when heated.

Extinguishing media

Suitable extinguishing media	Water spray. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO ₂).
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.

Protection of firefighters

Specific hazards arising from the chemical	Vapor may cause flash fire. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.
Protective equipment and precautions for firefighters	Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

Fire fighting equipment/instructions Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask. Withdraw immediately in case of rising sound from venting safety devices or any discoloration of tanks due to fire. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Move containers from fire area if you can do it without risk. In the event of fire, cool tanks with water spray. Cool containers exposed to flames with water until well after the fire is out. For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Vapors may form explosive air mixtures even at room temperature. Prevent buildup of vapors or gases to explosive concentrations. Some of these materials, if spilled, may evaporate leaving a flammable residue. Water runoff can cause environmental damage.

Specific methods In the event of fire and/or explosion do not breathe fumes. Use water spray to cool unopened containers.

Hazardous combustion products Carbon monoxide. Carbon Dioxide. Hydrocarbons.

6. Accidental Release Measures

Personal precautions Keep unnecessary personnel away. Local authorities should be advised if significant spillages cannot be contained. Keep upwind. Keep out of low areas. Ventilate closed spaces before entering. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. See Section 8 of the MSDS for Personal Protective Equipment.

Environmental precautions Should not be released into the environment. Prevent further leakage or spillage if safe to do so. Prevent material from entering drains, sewers or low lying areas. See section 13 for waste disposal information.

Methods for containment Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Stop leak if you can do so without risk.

Methods for cleaning up

Use non-sparking tools and explosion-proof equipment.

Small Spills: Absorb spill with vermiculite or other inert material, then place in a container for chemical waste. Clean surface thoroughly to remove residual contamination. This material and its container must be disposed of as hazardous waste.

Large Spills: Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Prevent product from entering drains. Do not allow material to contaminate ground water system. Should not be released into the environment.

Other information

Clean up in accordance with all applicable regulations.

7. Handling and Storage**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.

Storage

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. ACGIH Threshold Limit Values**

Material	Type	Value
Isobutane (75-28-5)	TWA	1000 ppm
Components	Type	Value
Butane (106-97-8)	TWA	1000 ppm
Isobutane (75-28-5)	TWA	1000 ppm

Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
Butane (106-97-8)	TWA	1000 ppm

Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Material	Type	Value
Isobutane (75-28-5)	TWA	1000 ppm
Components	Type	Value
Butane (106-97-8)	STEL	750 ppm
	TWA	600 ppm
Isobutane (75-28-5)	TWA	1000 ppm

Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)

Components	Type	Value
Butane (106-97-8)	TWA	800 ppm
Isobutane (75-28-5)	TWA	800 ppm

Canada. Quebec OELs. (Ministry of Labor - Regulation Respecting the Quality of the Work Environment)

Components	Type	Value
Butane (106-97-8)	TWA	1900 mg/m3 800 ppm

Mexico. Occupational Exposure Limit Values

Components	Type	Value
Butane (106-97-8)	TWA	1900 mg/m3 800 ppm

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.

Personal protective equipment**Eye / face protection**

Wear approved safety glasses or goggles.

Skin protection

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.

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 & Chemical Properties

Appearance	Colorless liquefied gas.
Color	Colorless
Odor	Gasoline-like.
Odor threshold	Not available.
Physical state	Gas.
Form	Not available.
pH	Not available.
Melting point	-256 °F (-160 °C)
Freezing point	-256 °F (-160 °C)
Boiling point	10.9 °F (-11.7 °C)
Flash point	-117.7 °F (-83.15 °C) Closed Cup
Evaporation rate	Not available.
Flammability limits in air, upper, % by volume	8.4 %
Flammability limits in air, lower, % by volume	1.8 %
Vapor pressure	Not available.
Vapor density	2 (Air = 1)
Specific gravity	0.557
Solubility (water)	Insoluble in the cold water.
Partition coefficient (n-octanol/water)	Not available.
Auto-ignition temperature	888.5 °F (475.85 °C)
Decomposition temperature	Not available.
VOC	100 %
Percent volatile	Essentially 100%
Molecular formula	Mixture, not applicable

10. Chemical Stability & Reactivity Information

Chemical stability	Stable under normal temperature conditions and recommended use.
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. Acids.
Hazardous decomposition products	None known.
Possibility of hazardous reactions	Polymerization will not occur.

11. Toxicological Information

Toxicological data**Components****Test Results**

Butane (106-97-8)

Acute Inhalation LC50 Mouse: 680 mg/l 2 Hours

Acute Inhalation LC50 Rat: 658 mg/l 4 Hours

Toxicological information

Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

Acute effects	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").
Sensitization	Not assigned.
Chronic 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.
Carcinogenicity	Not assigned.
Epidemiology	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.
Mutagenicity	Not assigned.
Reproductive effects	Not assigned.
Symptoms and target organs	Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

12. Ecological Information

Ecotoxicity	Not expected to be harmful to aquatic organisms.
Persistence and degradability	Not available.
Bioaccumulation / Accumulation	No data available.
Partition coefficient (n-octanol/water)	Not available.
Mobility in environmental media	No data available.

13. Disposal Considerations

Disposal instructions	Dispose in accordance with all applicable regulations. Dispose of this material and its container to hazardous or special waste collection point. Incinerate the material under controlled conditions in an approved incinerator. Do not discharge into drains, water courses or onto the ground.
Contaminated packaging	Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

TDG

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations	This product is hazardous according to OSHA 29 CFR 1910.1200. All components are on the U.S. EPA TSCA Inventory List.
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TSCA Section 12(b) Export Notification(40 CFR 707, Subpt. D)

Not regulated.

CERCLA (Superfund) reportable quantity (lbs) (40 CFR 302.4)

Isobutane: 100

Butane: 100

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - No Delayed Hazard - No Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance (40 CFR 355, Appendix A)	No
Section 311/312 (40 CFR 370)	No
Drug Enforcement Administration (DEA) (21 CFR 1308.11-15)	Not controlled
Food and Drug Administration (FDA)	Total food additive Direct food additive GRAS food additive
Canadian regulations	This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.
WHMIS status	Non-controlled

Inventory status

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
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 that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Hazardous Substances (Director's): Listed substance

Butane (CAS 106-97-8) Listed.

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

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

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance

1,3-butadiene (CAS 106-99-0) Listed: April 1, 1988 Carcinogenic.

US - California Proposition 65 - CRT: Listed date/Developmental toxin

1,3-butadiene (CAS 106-99-0) Listed: April 16, 2004 Developmental toxin.

US - California Proposition 65 - CRT: Listed date/Female reproductive toxin

1,3-butadiene (CAS 106-99-0) Listed: April 16, 2004 Female reproductive toxin.

US - California Proposition 65 - CRT: Listed date/Male reproductive toxin

1,3-butadiene (CAS 106-99-0) Listed: April 16, 2004 Male reproductive toxin.

US - Massachusetts RTK - Substance: Listed substance

Butane (CAS 106-97-8) Listed.

Isobutane (CAS 75-28-5) Listed.

US - New Jersey Community RTK (EHS Survey): Reportable threshold

Butane (CAS 106-97-8) 500 LBS

Isobutane (CAS 75-28-5) 500 LBS

US - New Jersey RTK - Substances: Listed substance

Isobutane (CAS 75-28-5)

Listed.

US - Pennsylvania RTK - Hazardous Substances: Listed substance

Butane (CAS 106-97-8)

Listed.

Isobutane (CAS 75-28-5)

Listed.

16. Other Information**Further information**

HMIS® is a registered trade and service mark of the NPCA.

HMIS® ratings

Health: 1

Flammability: 4

Physical hazard: 0

NFPA ratings

Health: 1

Flammability: 4

Instability: 0

Disclaimer

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