

ISOBUTANE

SECTION 1. IDENTIFICATION

Product Identifier	ISOBUTANE
Other Means of Identification	Liquefied Petroleum Gas
Product Family	Natural Gas Liquids
Recommended Use	Fuel for heating, cooking, automobiles, welding/cutting, refrigeration, aerosol propellant. Chemical intermediate.
Restrictions on Use	Not recommended for uses other than those listed, or for non-industrial purposes.
Manufacturer/Supplier Identifier	Keyera and Affiliates Suite 200, The Ampersand, West Tower 144 - 4th Avenue SW Calgary, Alberta T2P 3N4
Main Phone Number	(403) 205-8300 / 1 (888) 699-4853 (Mon. - Fri. 8 AM - 5 PM)
Transportation Emergencies Only	CANUTEC (CAN), Ph.: 1-888-CAN-UTEC (226-8832) Cell: *666, (24 hr) CHEMTREC (US), 1-800-424-9300, (24 hr)

SECTION 2. HAZARD IDENTIFICATION

Classification

Flammable gas - Category 1; Gas under pressure - Refrigerated liquefied gas; Simple asphyxiant - Category 1; Acute toxicity (Oral) - Category 4; Acute toxicity (Dermal) - Category 4; Acute toxicity (Inhalation) - Category 3; Eye irritation - Category 2; Aspiration hazard - Category 1

Label Elements



Hazard Statement(s):

- Extremely flammable gas.
- Contains gas under pressure; may explode if heated.
- Contains refrigerated gas; may cause cryogenic burns or injury.
- Harmful in contact with skin.
- Causes serious eye irritation.
- Causes skin irritation.
- May be harmful if inhaled.
- May cause drowsiness or dizziness.
- May displace oxygen and cause rapid suffocation.

Precautionary Statement(s):

Prevention:

- Do not handle until all safety precautions have been read and understood.
- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

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Keep container tightly closed.
 Ground and bond container and receiving equipment.
 Use explosion-proof electrical, ventilating, and lighting equipment.
 Use only non-sparking tools.
 Take precautionary measures against static discharge.
 Do not breathe dust/fume/gas/mist/vapours/spray.
 Do not get in eyes, on skin, or on clothing.
 Wash thoroughly after handling.
 Do not eat, drink or smoke when using this product.
 Use only outdoors or in a well-ventilated area.
 Avoid release to the environment.
 Wear protective gloves/protective clothing/eye protection/face protection.

Response:

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 Eliminate all ignition sources if safe to do so.
 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 IF INHALED: Call a POISON CENTRE or doctor if you feel unwell.
 If experiencing respiratory symptoms: Call a POISON CENTRE or doctor.
 Get medical advice or attention if you feel unwell.
 If skin irritation or rash occurs: Get medical advice or attention.
 Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical attention/advice.

Storage:

Store in accordance with local, regional, national and international regulations.
 Store in a well-ventilated place. Keep container tightly closed.

Disposal:

Dispose of contents and container in accordance with local, regional, national and international regulations.

Other Hazards

EMERGENCY OVERVIEW :

FLAMMABLE GAS. Extremely flammable. May form flammable/explosive vapour-air mixtures. Electrostatic charges may be generated during handling. Electrostatic discharges may cause fire. May be a health and fire hazard in a confined space. Very cold! Can cause cold injury.

General Hygiene Comments :

Do NOT eat, drink or store food in work areas.
 Remove contaminated clothing and protective equipment before entering eating areas or leaving work area.
 Wash hands thoroughly after handling this product and before eating, using the washroom or leaving work area.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	%	Other Identifiers
Liquified petroleum gas	68476-85-7	100	LPG
Propane	74-98-6	1 - 2	Propyl hydride
Isobutane	75-28-5	97 - 98	2-methylpropane
n-Butane	106-97-8	0.1 - 1	Butyl hydride

Notes

Concentrations are expressed in % volume/volume.

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SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

In case of oxygen deficiency: take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment). Move to fresh air. Keep at rest in a position comfortable for breathing. If breathing is difficult, trained personnel should administer emergency oxygen if advised to do so by Poison Centre or doctor. If breathing has stopped, trained personnel should begin rescue breathing.

Skin Contact

Rinse with lukewarm, gently flowing water for 5 minutes. Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice or attention.

Eye Contact

Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for 15 minutes, while holding the eyelid(s) open. Immediately call a Poison Centre or doctor and follow their advice. Seek medical attention immediately.

Ingestion

Not a likely route of exposure. Potential for aspiration. If vomiting occurs naturally, have victim lean forward to reduce the likelihood of aspiration.

Most Important Symptoms and Effects, Acute and Delayed

If inhaled:

A high concentration can displace oxygen in the air. If less oxygen is available to breathe, symptoms such as rapid breathing, rapid heart rate, clumsiness, emotional upsets and fatigue can result. As less oxygen becomes available, nausea and vomiting, collapse, convulsions, coma and death can occur. Symptoms occur more quickly with physical effort. Lack of oxygen can cause permanent damage to organs including the brain and heart.

If on skin:

Direct contact with the liquefied gas can chill or freeze the skin (frostbite). Symptoms of more severe frostbite include a burning sensation and stiffness. The skin may become waxy white or yellow. Blistering, tissue death and infection may develop in severe cases.

If in eyes:

Direct contact with the liquefied gas can freeze the eye. Permanent eye damage or blindness can result.

Immediate Medical Attention and Special Treatment

Special Instructions

Treat symptomatically. CNS asphyxiant. May cause rhinitis, bronchitis, and occasionally pulmonary edema after severe exposure. Consider oxygen therapy. Frostbite damage may occur after severe exposure. Consult a Poison Control Centre for guidance.

SECTION 5. FIRE-FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media

Small fire: Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog.

Unsuitable Extinguishing Media

Do not use water in a stream or jet.

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Specific Hazards Arising from the Product

Flammable liquid and vapour. Can ignite at room temperature. Releases vapour that can form explosive mixture with air. May displace oxygen in the air, causing rapid suffocation. Contains gas under pressure; may explode if heated. Contains refrigerated gas; may cause cryogenic burns or injury. May accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a fire hazard.

In a fire, the following hazardous materials may be generated: nitrogen oxides; sulfur oxides; hydrogen sulfide; smoke and irritating vapours as a result of incomplete combustion.

Special Protective Equipment and Precautions for Fire-fighters

Stop leak/source before attempting to put out the fire. Product could form an explosive mixture and reignite. Wear full protective clothing and self-contained breathing apparatus.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel.

Do not touch damaged containers or spilled product unless wearing appropriate protective equipment.

Do not operate electrical equipment.

Vent contaminated area thoroughly. May accumulate in hazardous amounts in low-lying areas especially inside confined spaces, if ventilation is not sufficient.

Shut off leaks, if possible, without personal risks.

Eliminate all ignition sources. Use grounded, explosion-proof equipment.

Take precautionary measures against static discharge.

Before entry, especially into confined areas, check atmosphere with an appropriate monitor.

Environmental Precautions

It is good practice to prevent releases into the environment.

Methods and Materials for Containment and Cleaning Up

Ventilate the area to prevent the gas from accumulating, especially in confined spaces.

Keep out of low areas; released vapours may be heavier than air and travel along the ground, or collect in sewers, basements, or tanks.

Small spills or leaks:

Stop or reduce leak if safe to do so.

Ventilate the area to prevent the gas from accumulating, especially in confined spaces.

Do not use absorbents. Contain spill using noncombustible material such as vermiculite, earth or sand.

Do NOT use combustible materials such as sawdust.

Large spills or leaks:

Knock down gas with fog or fine water spray.

Do not direct water at spill or source.

If possible, turn leaking container so that gas escapes rather than liquefied gas.

Other Information

Report leaks/spills to local health, safety and environmental authorities, as required.

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SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Only use where there is adequate ventilation. Prevent uncontrolled release of product. Eliminate heat and ignition sources such as sparks, open flames, hot surfaces and static discharge. Post "No Smoking" signs. Electrically bond and ground equipment. Ground clips must contact bare metal. Check for oxygen deficiency in work area. If used in a confined space, check for oxygen deficiency before worker entry and during work. In the event of a spill or leak, exit the area immediately. It is good practice to: avoid breathing product; avoid skin and eye contact and wash hands after handling.

Conditions for Safe Storage

Store in a well ventilated area away from all sources of ignition. Avoid storage in confined spaces or near incompatible materials, oxidizers, or materials that support combustion.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters	ACGIH TLV®		OSHA PEL		AIHA WEEL	
	TWA	STEL	TWA	Ceiling	8-hr TWA	TWA
Propane	1000 ppm					
Isobutane		1000 ppm				
n-Butane		1000 ppm	800 ppm			

Appropriate Engineering Controls

Do not allow product to accumulate in the air in work or storage areas, or in confined spaces. Use local exhaust and general ventilation, if necessary, to maintain air oxygen levels at a minimum of 18%. Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored. Control static electricity discharges which includes bonding of equipment to ground.

Individual Protection Measures

Eye/Face Protection

Product can cause frostbite. Wear chemical safety goggles.

Skin Protection

Product can cause frostbite. Prevent all skin contact. Protect exposed skin using insulated gloves suitable for low temperatures, long sleeves, protective apron and trousers worn outside boots or over shoes.

Respiratory Protection

Not normally required if product is used as directed.

For non-routine or emergency situations: if the oxygen content of the air is below acceptable limits, wear a NIOSH approved self-contained breathing apparatus (SCBA) or supplied air respirator.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Colourless volatile liquefied gas.
Odour	Mild hydrocarbon
Odour Threshold	Not available
Melting Point/Freezing Point	-160 °C (melting); Not available (freezing)
Boiling point/Initial boiling point	< -11.7 °C

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Flash Point	< -60 °C
Evaporation Rate	> 1 (n-butyl acetate = 1)
Flammability (solid, gas)	Extremely flammable gas.
Upper/Lower Flammability or Explosive Limit	~ 8.5% (upper); ~ 1.6% (lower)
Vapour Pressure	~ 415 kPa at 37.8°C (100°F)
Vapour Density (air = 1)	> 1
Relative Density (water = 1)	0.562 - 0.564 at 15 °C (59 °F)
Solubility	Slightly soluble in water
Partition Coefficient, n-Octanol/Water (Log Kow)	2.88
Auto-ignition Temperature	~ 288 °C
Decomposition Temperature	Not available
Viscosity	Not available (kinematic)
Other Information	
Physical State	Gas
Molecular Formula	C ₄ H ₁₀
Molecular Weight	58 g/mol

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Not reactive.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

None expected under normal conditions of storage and use. Will not polymerize.

Conditions to Avoid

Open flames, sparks, static discharge, heat and other ignition sources. May form explosive mixture on contact with air.

Incompatible Materials

Strong oxidizing agents (e.g. perchloric acid).

Hazardous Decomposition Products

Hazardous decomposition products are not expected to form during normal storage.

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Inhalation; skin contact; eye contact; ingestion.

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Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Propane	> 800000 ppm (rat) (30-minute exposure)	Not available	Not available
Isobutane	368000 mg/kg (male mouse) (4-hour exposure) (vapour)	> 5000 mg/kg	> 5000 mg/kg
n-Butane	658 mg/L (rat) (4-hour exposure)	Not available	Not available

Skin Corrosion/Irritation

Prolonged or repeated contact with the skin may cause defatting of the skin leading to redness, itching, inflammation, cracking, dermatitis (rash), and possible secondary infection. Direct contact with the liquefied gas can chill or freeze the skin (frostbite).

Serious Eye Damage/Irritation

May be irritating to eyes. Symptoms may include redness, swelling, pain, tearing, and blurred or hazy vision. Direct contact with the liquefied gas can freeze the eye. Permanent eye damage or blindness can result.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

A high concentration can displace oxygen in the air. If less oxygen is available to breathe, symptoms such as rapid breathing, rapid heart rate, clumsiness, emotional upsets and fatigue can result. As less oxygen becomes available, nausea and vomiting, collapse, convulsions, coma and death can occur. Symptoms occur more quickly with physical effort. Lack of oxygen can cause permanent damage to organs including the brain and heart. At high concentrations: depression of the central nervous system, resulting in dizziness, light-headedness, headache, and nausea.

Skin Absorption

Not an expected route of exposure, however, exposure to cold vapour or liquid can cause severe burns.

Ingestion

Not a relevant route of exposure (gas).

Aspiration Hazard

Not known to be an aspiration hazard.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

No information was located. Not expected to be a hazard.

Respiratory and/or Skin Sensitization

Not a respiratory sensitizer. Not a skin sensitizer.

Carcinogenicity

Not known to cause cancer.

Reproductive Toxicity

Development of Offspring

No information was located. Material in general is not expected to cause harm. The material in general is not expected to produce teratogenic or embryotoxic effects. Not known to harm the unborn child.

Sexual Function and Fertility

No information was located. Material in general is not expected to cause harm. The material in general is not expected to have toxic reproductive effects.

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Effects on or via Lactation

No information was located.

Germ Cell Mutagenicity

Material in general is not expected to cause harm. The material in general is not expected to produce mutagenic effects.

Interactive Effects

Not expected to be a hazard.

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Not expected to have long term toxic effects.

Persistence and Degradability

No ingredient of this product or its degradation products is known to be highly persistent.

Bioaccumulative Potential

This product and its degradation products are not known to bioaccumulate.

Mobility in Soil

If released, this material will move rapidly through and into the environment.

Other Adverse Effects

There is no information available.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

Material Disposal:

Do not discharge into areas where there is a risk of forming an explosive mixture with air.

Local Legislation:

Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be complied with.

SECTION 14. TRANSPORT INFORMATION

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
Canadian TDG	1075	LIQUEFIED PETROLEUM GASES or PETROLEUM GASES, LIQUEFIED	2.1	Not applicable
US DOT	1075	LIQUEFIED PETROLEUM GASES or PETROLEUM GASES, LIQUEFIED	2.1	Not applicable

Environmental Hazards

Not applicable

Special Precautions

Not applicable

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Transport in Bulk according to International Maritime Organization Instruments

Not applicable

Emergency Response Guide No. GUIDE 115**Other Information** Transport Class and Packing Group assigned are based on the general physical properties and composition of the material or materials tested.**SECTION 15. REGULATORY INFORMATION****Safety, Health and Environmental Regulations**

This section is not required by WHMIS.

SECTION 16. OTHER INFORMATION**NFPA Rating** **Health - 2** **Flammability - 4** **Instability - 0****SDS Prepared By** Bureau Veritas Canada
Phone No. 1-800-386-7247**Date of Preparation** August 05, 2021
Date of Last Revision August 05, 2021**Revision Indicators** All sections revised form original Keyera SDS last revision date of August 31, 2015.**Key to Abbreviations** ACGIH® = American Conference of Governmental Industrial Hygienists
 OSHA = US Occupational Safety and Health Administration
 RTECS® = Registry of Toxic Effects of Chemical Substances**References** CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). NIOSH Pocket Guide database. National Institute for Occupational Safety and Health. Available from Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Dassault Systèmes/BIOVIA ("BIOVIA"). Available from Canadian Centre for Occupational Health and Safety (CCOHS).**Disclaimer** This SDS provides safety information and was developed for employees, customers and agents of Keyera and Affiliates from data obtained from client provided sources, and submitted to Bureau Veritas Canada. The information may not be valid or complete if the product or material is used in combination with other products or materials, or in any process. This information is intended for reasonable normal usage and recommended practices, and to underscore the potential hazards that may be inherent to the nature of the product or material. Although every effort is made to ensure accuracy and completeness of the contained information, it is understood that Bureau Veritas Canada makes no warranty as to the accuracy or completeness of information and assumes no liability for any damage or loss suffered as result of any inaccuracy or incompleteness therein. This information is considered to be as accurate as possible, as of the date of preparation. The reader is invited to contact Keyera and Affiliates at the address shown to ensure the information is up to date or to obtain further information related to an unusual or other use.

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SDS representative location(s) :

Hull Facility