

## 1. Identification

**Product identifier** Isobutane  
**Other means of identification** None.  
**Recommended use** Fuel.  
**Recommended restrictions** None known.  
**Manufacturer/Importer/Supplier/Distributor information**  
**Manufacturer/Supplier** Devon Energy Production Company, L.P.  
 333 W. Sheridan Avenue  
 Oklahoma City, OK 73102-5010  
**Telephone** (405) 235-3611  
**Emergency** CHEMTREC 24 Hour Emergency  
 Within the USA (800) 424-9300  
 Outside the USA +1 703-527-3887

## 2. Hazard(s) identification

**Physical hazards** Flammable gases Category 1  
 Gases under pressure Liquefied gas  
**Health hazards** Not classified.  
**OSHA defined hazards** Simple asphyxiant  
**Label elements**



**Signal word** Danger

**Hazard statement** Extremely flammable gas. Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.

### Precautionary statement

**Prevention** Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Wear respiratory protection.

**Response** Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

**Storage** Protect from sunlight. Store in a well-ventilated place.

**Disposal** Dispose of waste and residues in accordance with local authority requirements.

**Hazard(s) not otherwise classified (HNOC)** None known.

**Supplemental information** None.

## 3. Composition/information on ingredients

### Mixtures

Chemical name	CAS number	%
Isobutane	75-28-5	95-100
Butane	106-97-8	<3

**Composition comments** All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

#### 4. First-aid measures

**Inhalation** Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory tract irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation. Get medical attention if breathing difficulty persists.

**Skin contact** Not likely, due to the form of the product. If frostbite occurs, immerse affected area in warm water (not exceeding 105°F/41°C). Keep immersed for 20 to 40 minutes. Get medical attention immediately.

**Eye contact** Not likely, due to the form of the product. If frostbite occurs, immediately flush eyes with plenty of warm water (not exceeding 105°F/41°C) for at least 15 minutes. If easy to do, remove contact lenses. Get medical attention promptly if symptoms persist or occur after washing.

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

**Most important symptoms/effects, acute and delayed** Symptoms of overexposure can include shortness of breath, drowsiness, headaches, confusion, decreased coordination, visual disturbances and vomiting, and are reversible if exposure is stopped. Continued exposure can lead to hypoxia (inadequate oxygen), cyanosis (bluish discoloration of the skin), numbness of the extremities, unconsciousness and death. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

**Indication of immediate medical attention and special treatment needed** Provide general supportive measures and treat symptomatically.

**General information** Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

#### 5. Fire-fighting measures

**Suitable extinguishing media** Water fog. Water spray. Foam. Dry chemical powder. Carbon dioxide (CO<sub>2</sub>).

**Unsuitable extinguishing media** Do not use water jet as an extinguisher, as this will spread the fire.

**Specific hazards arising from the chemical** Extremely flammable gas. Containers may explode when heated. During fire, gases hazardous to health may be formed.

**Special protective equipment and precautions for firefighters** Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with full face-piece operated in positive pressure mode. Use approved gas detectors in confined spaces.

**Fire fighting equipment/instructions** In case of fire and/or explosion do not breathe fumes. 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.

**Specific methods** Evacuate area. Check oxygen content before entering area. Stop leak if you can do so without risk. Remove pressurized gas cylinders from the immediate vicinity. Turn leaking cylinder with the leak up to prevent escape of gas in liquid state. Closed containers can burst violently when heated, due to excess pressure build-up. Use water spray to keep fire-exposed containers cool.

**General fire hazards** Extremely flammable gas. Contents under pressure. Pressurized container may explode when exposed to heat or flame.

#### 6. Accidental release measures

**Personal precautions, protective equipment and emergency procedures** Eliminate all sources of ignition in vicinity of released gas. Evacuate all non-essential personnel to an area upwind. Stop leak if possible without any risk. Ventilate enclosed areas to prevent formation of toxic, flammable or oxygen deficient atmospheres. Use suitable protective equipment (section 8). Follow all fire-fighting procedures (section 5). Keep out of low areas. Many gases are heavier than air and will spread along ground and collect in low or confined areas (sewers, basements, tanks). Wear appropriate protective equipment and clothing during clean-up. Emergency personnel need self-contained breathing equipment. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Local authorities should be advised if significant spillages cannot be contained.

**Methods and materials for containment and cleaning up**

Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Stop leak if you can do so without risk. If possible, turn leaking containers so that gas escapes rather than liquid. Isolate area until gas has dispersed. For waste disposal, see section 13 of the SDS.

**Environmental precautions**

Prevent further leakage or spillage if safe to do so. Attempt to stop the gas leak, if no risk is involved.

**7. Handling and storage****Precautions for safe handling**

Eliminate all sources of ignition. Before entering storage tanks and commencing any operation in a confined area, check the atmosphere for oxygen content and flammability. Valve protection caps must remain in place unless container is secured with valve outlet piping to use point. Close valve after each use and when container is empty. Do not drop, drag, slide or roll cylinders on their sides. Use a suitable hand truck to move gas containers. Use a pressure reducing regulator when connecting container to piping or systems. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings. Use an adjustable strap wrench to remove over-tight or rusted caps. Open valve slowly. Do not use gas directly from containers. Do not heat container by any means to increase the discharge rate of product from the container. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not enter storage areas or confined spaces unless adequately ventilated. Use only outdoors or in a well-ventilated area. Oxygen concentration should not fall below 19.5 % at sea level (pO<sub>2</sub> = 135 mmHg). All equipment used when handling the product must be grounded. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

**Conditions for safe storage, including any incompatibilities**

Keep away from heat, sparks and open flame. Store in a cool, dry place out of direct sunlight. Secure cylinders in an upright position at all times, close all valves when not in use. Store in original tightly closed container. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS).

**8. Exposure controls/personal protection****Occupational exposure limits****US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)**

Components	Type	Value
Propane (CAS 74-98-6)	PEL	1800 mg/m <sup>3</sup> 1000 ppm

**US. ACGIH Threshold Limit Values**

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

**US. NIOSH: Pocket Guide to Chemical Hazards**

Components	Type	Value
Butane (CAS 106-97-8)	TWA	1900 mg/m <sup>3</sup> 800 ppm
Isobutane (CAS 75-28-5)	TWA	1900 mg/m <sup>3</sup> 800 ppm
Propane (CAS 74-98-6)	TWA	1800 mg/m <sup>3</sup> 1000 ppm

**Biological limit values**

No biological exposure limits noted for the ingredient(s).

**Appropriate engineering controls**

Explosion proof exhaust ventilation should be used. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide adequate ventilation and minimize the risk of inhalation of gas.

**Individual protection measures, such as personal protective equipment****Eye/face protection**

If eye contact is likely, safety glasses with side shields or chemical type goggles should be worn.

**Skin protection****Hand protection**

Wear cold insulating gloves.

**Skin protection****Other**

No special requirements under ordinary conditions of use.

**Respiratory protection**

Wear approved respiratory protection when working with this material unless ventilation is adequate to keep airborne concentrations below recommended exposure standards.

<b>Thermal hazards</b>	Wear appropriate thermal protective clothing, when necessary.
<b>General hygiene considerations</b>	When using do not smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

## 9. Physical and chemical properties

### Appearance

<b>Physical state</b>	Gas.
<b>Form</b>	Gas under normal atmospheric conditions; liquid under pressure.
<b>Color</b>	Colorless.
<b>Odor</b>	Odorless at low concentrations, may have gasoline odor at high concentrations
<b>Odor threshold</b>	Not available.
<b>pH</b>	Not available.
<b>Melting point/freezing point</b>	Not available.
<b>Initial boiling point and boiling range</b>	10.4 °F (-12 °C)
<b>Flash point</b>	-117.0 °F (-82.8 °C) Tag Closed Cup
<b>Evaporation rate</b>	> 1 (Water=1)
<b>Flammability (solid, gas)</b>	Not available.
<b>Upper/lower flammability or explosive limits</b>	
<b>Flammability limit - lower (%)</b>	1.8
<b>Flammability limit - upper (%)</b>	8.4
<b>Explosive limit - lower (%)</b>	Not available.
<b>Explosive limit - upper (%)</b>	Not available.
<b>Vapor pressure</b>	72 psi (38°C/100°F)
<b>Vapor density</b>	2.1
<b>Relative density</b>	0.563 (Water=1)
<b>Solubility(ies)</b>	
<b>Solubility (water)</b>	Slightly soluble in water.
<b>Partition coefficient (n-octanol/water)</b>	No data available.
<b>Auto-ignition temperature</b>	863.6 °F (462 °C)
<b>Decomposition temperature</b>	Not available.
<b>Viscosity</b>	Not applicable

## 10. Stability and reactivity

<b>Reactivity</b>	The product is stable and non-reactive under normal conditions of use, storage and transport.
<b>Chemical stability</b>	Material is stable under normal conditions.
<b>Possibility of hazardous reactions</b>	No dangerous reaction known under conditions of normal use.
<b>Conditions to avoid</b>	Avoid heat, sparks, open flames and other ignition sources. Avoid temperatures exceeding the flash point. Contact with incompatible materials.
<b>Incompatible materials</b>	Strong oxidizing agents.
<b>Hazardous decomposition products</b>	Thermal decomposition of this product can generate carbon monoxide and carbon dioxide.

## 11. Toxicological information

### Information on likely routes of exposure

<b>Inhalation</b>	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. May cause drowsiness or dizziness. Inhalation of high concentrations may result in central nervous system depression and reduce the ability of the blood to carry oxygen to body tissues.
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<b>Skin contact</b>	Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").
<b>Eye contact</b>	Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").
<b>Ingestion</b>	This material is a gas under normal atmospheric conditions and ingestion is unlikely.
<b>Symptoms related to the physical, chemical and toxicological characteristics</b>	Symptoms of overexposure can include shortness of breath, drowsiness, headaches, confusion, decreased coordination, visual disturbances and vomiting, and are reversible if exposure is stopped. Continued exposure can lead to hypoxia (inadequate oxygen), cyanosis (bluish discoloration of the skin), numbness of the extremities, unconsciousness and death. Exposure to rapidly expanding gas or vaporizing liquid may cause frostbite ("cold burn").

**Information on toxicological effects**

**Acute toxicity** Not expected to be acutely toxic.

Components	Species	Test Results
Butane (CAS 106-97-8)		
<b>Acute</b>		
<i>Inhalation</i>		
LC50	Rat	658 mg/l, 4 Hours
Isobutane (CAS 75-28-5)		
<b>Acute</b>		
<i>Inhalation</i>		
LC50	Mouse	52 mg/l, 1 Hours
Propane (CAS 74-98-6)		
<b>Acute</b>		
<i>Inhalation</i>		
LC50	Rat	1355 mg/l

**Skin corrosion/irritation** Not classified.

**Serious eye damage/eye irritation** Not classified.

**Respiratory or skin sensitization**

**Respiratory sensitization** Not a respiratory sensitizer.

**Skin sensitization** This product is not expected to cause skin sensitization.

**Germ cell mutagenicity** No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

**Carcinogenicity** This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

**IARC Monographs. Overall Evaluation of Carcinogenicity**

Not listed.

**NTP Report on Carcinogens**

Not listed.

**OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not regulated.

**Reproductive toxicity** This product is not expected to cause reproductive or developmental effects.

**Specific target organ toxicity - single exposure** Not classified.

**Specific target organ toxicity - repeated exposure** Not classified.

**Aspiration hazard** Not likely, due to the form of the product.

**Chronic effects** Exposure over a long period of time may cause central nervous system effects.

**Further information** This product may contain detectable but varying quantities of the naturally occurring radioactive substance radon 222. The amount in the gas itself is not hazardous, but since radon rapidly decays (t1/2 = 3.82 days) to form other radioactive elements including lead 210, polonium 210, and bismuth 210, equipment may be radioactive. The radon daughters are solids and therefore may attach to dust particles or form films and sludges in equipment. Inhalation, ingestion or skin contact with radon daughters can lead to the deposition of radioactive material in the lungs, bone, blood forming organs, intestinal tract, kidney and colon. Occupational exposure to radon and radon daughters has been associated with an increased risk of lung cancer in underground uranium miners. Follow the special precautions listed in handling and storage section of this document (see section 7).

## 12. Ecological information

<b>Ecotoxicity</b>	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
<b>Persistence and degradability</b>	No data is available on the degradability of this product.
<b>Bioaccumulative potential</b>	No data available on bioaccumulation.
<b>Partition coefficient n-octanol / water (log Kow)</b>	
Butane (CAS 106-97-8)	2.89
Isobutane (CAS 75-28-5)	2.76
Propane (CAS 74-98-6)	2.36
<b>Mobility in soil</b>	Highly volatile, will partition rapidly to air.
<b>Mobility in general</b>	The product contains volatile substances, which may spread in the atmosphere.
<b>Other adverse effects</b>	The product is a volatile organic compound which has a photochemical ozone creation potential.

## 13. Disposal considerations

<b>Disposal instructions</b>	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
<b>Local disposal regulations</b>	Dispose in accordance with all applicable regulations.
<b>Hazardous waste code</b>	D001: Waste Flammable material with a flash point <140 F
<b>Waste from residues / unused products</b>	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
<b>Contaminated packaging</b>	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

## 14. Transport information

### DOT

<b>UN number</b>	UN1969
<b>UN proper shipping name</b>	Isobutane
<b>Transport hazard class(es)</b>	
<b>Class</b>	2.1
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	2.1
<b>Packing group</b>	Not applicable.
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	No
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.
<b>Special provisions</b>	19, T50
<b>Packaging exceptions</b>	306
<b>Packaging non bulk</b>	304
<b>Packaging bulk</b>	314, 315

### IATA

<b>UN number</b>	UN1969
<b>UN proper shipping name</b>	Isobutane
<b>Transport hazard class(es)</b>	
<b>Class</b>	2.1
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	2.1
<b>Packing group</b>	Not applicable.
<b>Environmental hazards</b>	No
<b>ERG Code</b>	10L
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.

### IMDG

<b>UN number</b>	UN1969
<b>UN proper shipping name</b>	ISOBUTANE
<b>Transport hazard class(es)</b>	
<b>Class</b>	2.1
<b>Subsidiary risk</b>	-
<b>Label(s)</b>	2.1

<b>Packing group</b>	Not applicable.
<b>Environmental hazards</b>	
<b>Marine pollutant</b>	No
<b>EmS</b>	F-D, S-U
<b>Special precautions for user</b>	Read safety instructions, SDS and emergency procedures before handling.
<b>Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code</b>	Not applicable.

## 15. Regulatory information

**US federal regulations** This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.  
All components are on the U.S. EPA TSCA Inventory List.

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

Not regulated.

### **OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)**

Not regulated.

### **CERCLA Hazardous Substance List (40 CFR 302.4)**

Butane (CAS 106-97-8)	LISTED
Isobutane (CAS 75-28-5)	LISTED
Propane (CAS 74-98-6)	LISTED

### **Superfund Amendments and Reauthorization Act of 1986 (SARA)**

**Hazard categories** Immediate Hazard - Yes  
Delayed Hazard - No  
Fire Hazard - Yes  
Pressure Hazard - Yes  
Reactivity Hazard - No

### **SARA 302 Extremely hazardous substance**

Not listed.

**SARA 311/312 Hazardous chemical** Yes

### **SARA 313 (TRI reporting)**

Not regulated.

### **Other federal regulations**

#### **Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Not regulated.

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

Butane (CAS 106-97-8)
Isobutane (CAS 75-28-5)
Propane (CAS 74-98-6)

**Safe Drinking Water Act (SDWA)** Not regulated.

### **US state regulations**

#### **US. Massachusetts RTK - Substance List**

Butane (CAS 106-97-8)
Isobutane (CAS 75-28-5)
Propane (CAS 74-98-6)

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

Butane (CAS 106-97-8)
Isobutane (CAS 75-28-5)
Propane (CAS 74-98-6)

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

Butane (CAS 106-97-8)
Isobutane (CAS 75-28-5)
Propane (CAS 74-98-6)

#### **US. Rhode Island RTK**

Butane (CAS 106-97-8)
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Isobutane (CAS 75-28-5)

Propane (CAS 74-98-6)

### US. California Proposition 65

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

### 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
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	19-March-2015
Revision date	19-March-2015
Version #	03

#### NFPA ratings



#### Disclaimer

Devon US Operations cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.