

# SAFETY DATA SHEET

## SECTION 1: Identification of the substance/mixture and of the company/undertaking

### 1.1. Product identifier

**Name of the substance** Butane / Liquefied Petroleum Gas (LPG)  
**Identification number** 106-97-8  
**Registration number** -  
**Synonyms** None.  
**SDS number** 2010  
**Issue date** 29-July-2011  
**Version number** 06  
**Revision date** 24-July-2013  
**Supersedes date** 17-August-2012

### 1.2. Relevant identified uses of the substance or mixture and uses advised against

**Identified uses** Fuel.  
**Uses advised against** None known.

### 1.3. Details of the supplier of the safety data sheet

#### Supplier

**Company name** Valero Energy Ltd  
**Address** 1 Westferry Circus  
Canary Wharf  
London E14 4HA  
UK  
**Telephone** 01/210 345 4593 (General information; US)  
**e-mail** CorpHSE@valero.com  
**Contact person** Industrial Hygienist

**1.4. Emergency telephone number** 0044/(0)18 65 407333

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC as amended

**Classification** F+;R12

Classification according to Regulation (EC) No 1272/2008 as amended

#### Physical hazards

Flammable gases	Category 1	H220 - Extremely flammable gas.
Gases under pressure	Compressed gas	H280 - Contains gas under pressure; may explode if heated.

#### Health hazards

Specific target organ toxicity - single exposure	Category 3 narcotic effects	H336 - May cause drowsiness or dizziness.
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#### Hazard summary

**Physical hazards** Extremely flammable.  
**Health hazards** Not classified for health hazards. However, occupational exposure to the mixture or substance(s) may cause adverse health effects.  
**Environmental hazards** Not classified for hazards to the environment.  
**Specific hazards** Not available.  
**Main symptoms** May cause drowsiness or dizziness. Contact with evaporating liquid may cause frostbite or freezing of skin.

### 2.2. Label elements

Label according to Regulation (EC) No. 1272/2008 as amended

**Identification number** 106-97-8

**Hazard pictograms****Signal word**

Danger

**Hazard statements**

H220 - Extremely flammable gas.  
 H280 - Contains gas under pressure; may explode if heated.  
 H336 - May cause drowsiness or dizziness.

**Precautionary statements****Prevention**

P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.  
 P243 - Take precautionary measures against static discharge.  
 P281 - Use personal protective equipment as required.

**Response**

P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

**Storage**

P410 + P403 - Protect from sunlight. Store in a well-ventilated place.

**Disposal**

P501 - P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

**Supplemental label information**

Not applicable.

**2.3. Other hazards**

Static accumulator - 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).

**SECTION 3: Composition/information on ingredients****3.1. Substances****General information**

Chemical name	%	CAS-No. / EC No.	REACH Registration No.	INDEX No.	Notes
Butane	100	106-97-8 271-009-7	-	649-195-00-X	
<b>Classification:</b>		<b>DSD:</b> F+;R12			
		<b>CLP:</b> Flam. Gas 1;H220, Press. Gas;H280			

**SECTION 4: First aid measures****General information**

Not available.

**4.1. Description of 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**

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.

**4.2. Most important symptoms and effects, both acute and delayed**

Contact with liquefied gas may cause frostbite.

**4.3. Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

**SECTION 5: Firefighting measures****General fire hazards**

Extremely flammable gas. Containers may explode when heated.

**5.1. Extinguishing media****Suitable extinguishing media**

Water spray. Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

**Unsuitable extinguishing media**

Do not use a solid water stream as it may scatter and spread fire.

**5.2. Special hazards arising from the substance or mixture**

Vapor may cause flash fire. Vapors can flow along surfaces to distant ignition source and flash back. Sensitive to static discharge.

### 5.3. Advice for firefighters

#### Special protective equipment for firefighters

Wear full protective clothing, including helmet, self-contained positive pressure or pressure demand breathing apparatus, protective clothing and face mask.

#### Special fire fighting procedures

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 discolouration 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. Vapours may form explosive air mixtures even at room temperature. Prevent buildup of vapours or gasses to explosive concentrations. Some of these materials, if spilled, may evaporate leaving a flammable residue. Water runoff can cause environmental damage.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

#### For non-emergency personnel

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 for personal protective equipment.

#### For emergency responders

Keep unnecessary personnel away. Wear protective clothing as described in Section 8 of this safety data sheet.

### 6.2. 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.

### 6.3. Methods and material for containment and cleaning up

Ventilate well, stop flow of gas or liquid if possible. Immediately contact emergency personnel.

### 6.4. Reference to other sections

For personal protection, see section 8 of the SDS. For waste disposal, see section 13 of the SDS.

## SECTION 7: Handling and storage

### 7.1. 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.

### 7.2. 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.

### 7.3. Specific end use(s)

Fuel.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational exposure limits

##### Austria. MAK List

Components	Type	Value
Butane (CAS 106-97-8)	Ceiling	3800 mg/m <sup>3</sup>
		1600 ppm
	MAK	1900 mg/m <sup>3</sup> 800 ppm

##### Bulgaria. OELs. Regulation No 13 on protection of workers against risks of exposure to chemical agents at work

Components	Type	Value
Butane (CAS 106-97-8)	TWA	1800 mg/m <sup>3</sup>

##### Denmark. Exposure Limit Values

Components	Type	Value
Butane (CAS 106-97-8)	TLV	1200 mg/m <sup>3</sup>
		500 ppm

##### Estonia. OELs. Occupational Exposure Limits of Hazardous Substances. (Annex of Regulation No. 293 of 18 September 2001)

Components	Type	Value
Butane (CAS 106-97-8)	TWA	1500 mg/m <sup>3</sup>

**Estonia. OELs. Occupational Exposure Limits of Hazardous Substances. (Annex of Regulation No. 293 of 18 September 2001)**

<b>Components</b>	<b>Type</b>	<b>Value</b>
		800 ppm

**Finland. Workplace Exposure Limits**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	STEL	2400 mg/m <sup>3</sup>
		1000 ppm
	TWA	1900 mg/m <sup>3</sup>
		800 ppm

**France. Threshold Limit Values (VLEP) for Occupational Exposure to Chemicals in France, INRS ED 984**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	VME	1900 mg/m <sup>3</sup>
		800 ppm

**Germany. DFG MAK List (advisory OELs). Commission for the Investigation of Health Hazards of Chemical Compounds in the Work Area (DFG)**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	TWA	2400 mg/m <sup>3</sup>
		1000 ppm

**Germany. TRGS 900, Limit Values in the Ambient Air at the Workplace**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	AGW	2400 mg/m <sup>3</sup>
		1000 ppm

**Greece. OELs (Decree No. 90/1999, as amended)**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	TWA	2350 mg/m <sup>3</sup>
		1000 ppm

**Hungary. OELs. Joint Decree on Chemical Safety of Workplaces**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	STEL	9400 mg/m <sup>3</sup>
	TWA	2350 mg/m <sup>3</sup>

**Iceland. OELs. Regulation 154/1999 on occupational exposure limits**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	TWA	1200 mg/m <sup>3</sup>
		500 ppm

**Ireland. Occupational Exposure Limits**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	TWA	1000 ppm

**Italy. OELs**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	TWA	1000 ppm

**Latvia. OELs. Occupational exposure limit values of chemical substances in work environment**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	STEL	300 mg/m <sup>3</sup>
	TWA	100 mg/m <sup>3</sup>

**Norway. Administrative Norms for Contaminants in the Workplace**

<b>Components</b>	<b>Type</b>	<b>Value</b>
Butane (CAS 106-97-8)	TLV	600 mg/m <sup>3</sup>
		250 ppm

**Poland. MACs. Minister of Labour and Social Policy Regarding Maximum Allowable Concentrations and Intensities in Working Environment**

Components	Type	Value
Butane (CAS 106-97-8)	STEL	3000 mg/m <sup>3</sup>
	TWA	1900 mg/m <sup>3</sup>

**Portugal. VLEs. Norm on occupational exposure to chemical agents (NP 1796)**

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

**Romania. OELs. Protection of workers from exposure to chemical agents at the workplace**

Components	Type	Value
Butane (CAS 106-97-8)	STEL	1500 mg/m <sup>3</sup>
	TWA	1200 mg/m <sup>3</sup>

**Slovenia. OELs. Regulations concerning protection of workers against risks due to exposure to chemicals while working (Official Gazette of the Republic of Slovenia)**

Components	Type	Value
Butane (CAS 106-97-8)	TWA	2400 mg/m <sup>3</sup> 1000 ppm

**Spain. Occupational Exposure Limits**

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

**Switzerland. SUVA Grenzwerte am Arbeitsplatz**

Components	Type	Value
Butane (CAS 106-97-8)	STEL	7200 mg/m <sup>3</sup> 3200 ppm
	TWA	1900 mg/m <sup>3</sup> 800 ppm

**UK. EH40 Workplace Exposure Limits (WELs)**

Components	Type	Value
Butane (CAS 106-97-8)	STEL	1810 mg/m <sup>3</sup> 750 ppm
	TWA	1450 mg/m <sup>3</sup> 600 ppm

**Biological limit values** No biological exposure limits noted for the ingredient(s).

**Recommended monitoring procedures** Not available.

**Derived no-effect level (DNEL)** Not available.

**Predicted no effect concentrations (PNECs)** Not available.

**8.2. Exposure controls**

**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**

**General information** Personal protective equipment should be chosen according to the CEN standards and in discussion with the supplier of the personal protective equipment. Contact with liquefied gas might cause frostbites, in some cases with tissue damage.

**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.

**Hygiene measures** 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.

**Environmental exposure controls** Not available.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

**Appearance** Colorless liquefied gas.

**Physical state** Gas.

**Form** Compressed liquefied gas.

**Colour** Colorless

**Odour** Odourless.

**Odour threshold** Not available.

**pH** Not available.

**Melting point/freezing point** -159,4 °C (-254,92 °F) Typical.

**Initial boiling point and boiling range** -12 °C (10,4 °F)

**Flash point** -118,0 °C (-180,4 °F) Pensky-Martens Closed Cup

**Evaporation rate** Not available.

**Flammability (solid, gas)** Not available.

**Upper/lower flammability or explosive limits**

**Flammability limit - lower (%)** 1,8 %

**Flammability limit - upper (%)** 8,4 %

**Vapour pressure** Not available.

**Vapour density** 1,6

**Relative density** 0,56 (15°C)

**Solubility(ies)** Insoluble.

**Partition coefficient (n-octanol/water)** Not available.

**Auto-ignition temperature** -460 °C (-796 °F)

**Decomposition temperature** Not available.

**Viscosity** Not available.

**Explosive properties** Not available.

**Oxidizing properties** Not available.

### 9.2. Other information

**Molecular formula** C4-H10

**Molecular weight** 58,12 g/mol

**VOC (Weight %)** 100 %

## SECTION 10: Stability and reactivity

**10.1. Reactivity** Not available.

**10.2. Chemical stability** Stable under normal temperature conditions and recommended use.

**10.3. Possibility of hazardous reactions** Polymerization will not occur.

**10.4. Conditions to avoid** In a fire or if heated, a pressure increase will occur and the container may burst or explode.

**10.5. Incompatible materials** Oxidizing agents. Acids.

**10.6. Hazardous decomposition products** None known.

## SECTION 11: Toxicological information

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

## Information on likely routes of exposure

<b>Ingestion</b>	Not applicable.
<b>Inhalation</b>	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels.
<b>Skin contact</b>	Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.
<b>Eye contact</b>	Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.
<b>Symptoms</b>	Exposure to rapidly expanding gas or vapourizing liquid may cause frostbite ("cold burn").

## 11.1. Information on toxicological effects

<b>Acute toxicity</b>	Suffocation (asphyxiant) hazard - if allowed to accumulate to concentrations that reduce oxygen below safe breathing levels. Exposure to rapidly expanding gas or vapourizing liquid may cause frostbite ("cold burn").
<b>Skin corrosion/irritation</b>	Not assigned.
<b>Serious eye damage/eye irritation</b>	Not assigned.
<b>Respiratory sensitisation</b>	Not assigned.
<b>Skin sensitisation</b>	Not available.
<b>Germ cell mutagenicity</b>	Not assigned.
<b>Carcinogenicity</b>	Not assigned.
<b>Reproductive toxicity</b>	Not assigned.
<b>Specific target organ toxicity - single exposure</b>	May cause drowsiness or dizziness.
<b>Specific target organ toxicity - repeated exposure</b>	Not assigned.
<b>Aspiration hazard</b>	Not applicable.
<b>Mixture versus substance information</b>	Not available.
<b>Other information</b>	Not available.

## SECTION 12: Ecological information

<b>12.1. Toxicity</b>	Not expected to be harmful to aquatic organisms.
<b>12.2. Persistence and degradability</b>	Not available.
<b>12.3. Bioaccumulative potential</b>	Not available.
<b>Bioconcentration factor (BCF)</b>	Not available.
<b>12.4. Mobility in soil</b>	Not available.
<b>12.5. Results of PBT and vPvB assessment</b>	Not a PBT or vPvB substance or mixture.
<b>12.6. Other adverse effects</b>	Not available.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

<b>Residual waste</b>	Dispose of in accordance with local regulations.
<b>Contaminated packaging</b>	Since emptied containers may retain product residue, follow label warnings even after container is emptied.
<b>EU waste code</b>	05 01 99
<b>Disposal methods/information</b>	Dispose in accordance with all applicable regulations. This material and its container must be disposed of as hazardous waste. Do not discharge into drains, water courses or onto the ground.

## SECTION 14: Transport information

### ADR

<b>14.1. UN number</b>	UN1011
<b>14.2. UN proper shipping name</b>	BUTANE
<b>14.3. Transport hazard class(es)</b>	2.1
<b>Subsidiary class(es)</b>	-
<b>14.4. Packing group</b>	Not available.
<b>14.5. Environmental hazards</b>	No

Tunnel restriction code Not available.  
Labels required 2.1  
14.6. Special precautions Not available.  
for user

#### RID

14.1. UN number UN1011  
14.2. UN proper shipping name BUTANE  
14.3. Transport hazard class(es) 2.1  
Subsidiary class(es) -  
14.4. Packing group Not available.  
14.5. Environmental hazards No  
Labels required 2.1 (+13)  
14.6. Special precautions Not available.  
for user

#### ADN

14.1. UN number UN1011  
14.2. UN proper shipping name Butane  
14.3. Transport hazard class(es) Not available.  
Subsidiary class(es) -  
14.4. Packing group Not available.  
14.5. Environmental hazards No  
Labels required 2.1  
14.6. Special precautions Not available.  
for user

#### IATA

14.1. UN number UN1011  
14.2. UN proper shipping name Butane  
14.3. Transport hazard class(es) 2.1  
Subsidiary class(es) -  
14.4. Packing group Not available.  
14.5. Environmental hazards No  
Labels required Not available.  
ERG code 10L  
14.6. Special precautions Not available.  
for user

#### IMDG

14.1. UN number UN1011  
14.2. UN proper shipping name BUTANE  
14.3. Transport hazard class(es) 2.1  
Subsidiary class(es) -  
14.4. Packing group Not available.  
14.5. Environmental hazards  
Marine pollutant No  
Labels required Not available.  
EmS F-D, S-U  
14.6. Special precautions Not available.  
for user

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code This product is a compressed or liquefied gas and when transported in bulk is covered under IGC code.

## SECTION 15: Regulatory information

### 15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

#### EU regulations



**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex I**

Not listed.

**Regulation (EC) No. 1005/2009 on substances that deplete the ozone layer, Annex II**

Not listed.

**Regulation (EC) No. 850/2004 On persistent organic pollutants, Annex I as amended**

Not listed.

**Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 1 as amended**

Not listed.

**Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 2 as amended**

Not listed.

**Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex I, part 3 as amended**

Not listed.

**Regulation (EC) No. 689/2008 concerning the export and import of dangerous chemicals, Annex V as amended**

Not listed.

**Regulation (EC) No. 166/2006 Annex II Pollutant Release and Transfer Registry**

Not listed.

**Regulation (EC) No. 1907/2006, REACH Article 59(1) Candidate List as currently published by ECHA**

Not listed.

#### **Authorisations**

**Regulation (EC) No. 1907/2006, REACH Annex XIV Substances subject to authorisation, as amended**

Not listed.

#### **Restrictions on use**

**Regulation (EC) No. 1907/2006, REACH Annex XVII Substances subject to restriction on marketing and use as amended**

Not listed.

**Directive 2004/37/EC: on the protection of workers from the risks related to exposure to carcinogens and mutagens at work**

Not regulated.

**Directive 92/85/EEC: on the safety and health of pregnant workers and workers who have recently given birth or are breastfeeding**

Not regulated.

#### **Other EU regulations**

**Directive 96/82/EC (Seveso II) on the control of major-accident hazards involving dangerous substances**

Not regulated.

**Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work**

Not listed.

**Directive 94/33/EC on the protection of young people at work**

Not listed.

#### **National regulations**

Not available.

#### **15.2. Chemical safety assessment**

Chemical Safety Assessment has been carried out.  
Annex for Exposure Scenarios is not required for this material.

## **SECTION 16: Other information**

#### **List of abbreviations**

DSD: Directive 67/548/EEC.  
CLP: Regulation No. 1272/2008.  
DNEL: Derived No-Effect Level.  
PNEC: Predicted No-Effect Concentration.  
PBT: Persistent, bioaccumulative and toxic.  
vPvB: Very Persistent and very Bioaccumulative.

#### **References**

Not available.

#### **Information on evaluation method leading to the classification of mixture**

The mixture is classified based on test data for physical hazards. The classification for health and environmental hazards is derived by a combination of calculation methods and test data, if available. For details, refer to Sections 9, 11 and 12.

#### **Full text of any statements or R-phrases and H-statements under Sections 2 to 15**

R12 Extremely flammable.

H220 Extremely flammable gas.  
H280 Contains gas under pressure; may explode if heated.

#### **This SDS contains revisions in the following section(s):**

This safety data sheet contains revisions in the following section(s): 2, 7.

#### **Training information**

Not available.

**Disclaimer**

This material Safety Data Sheet (SDS) was prepared in accordance with EC No 1272/2008 by Valero Energy Ltd. Valero Energy Ltd. does not assume any liability arising out of product use by others. The information, recommendations, and suggestions presented in this SDS are based upon test results and data believed to be reliable. The end user of the product has the responsibility for evaluating the adequacy of the data under the conditions of use, determining the safety, toxicity and suitability of the product under these conditions, and obtaining additional or clarifying information where uncertainty exists. No guarantee expressed or implied is made as to the effects of such use, the results to be obtained, or the safety and toxicity of the product in any specific application. Furthermore, the information herein is not represented as absolutely complete, since it is not practicable to provide all the scientific and study information in the format of this document, plus additional information may be necessary under exceptional conditions of use, or because of applicable laws or government regulations.