

SAFETY DATA SHEET

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

1.1. Product identifier

Name of the substance Isobutane
Identification number 75-28-5
Registration number 01-2119485395-27-0017
Synonyms None.
SDS number 2018
Issue date 27-July-2011
Version number 05
Revision date 06-August-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.

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 Not available.

2.2. Label elements

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

Identification number 75-28-5

Hazard pictograms



Signal word Danger

Hazard statements	H220 - Extremely flammable gas. H280 - Contains gas under pressure; may explode if heated.
Precautionary statements	
Prevention	P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Response	P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381 - Eliminate all ignition sources if safe to do so.
Storage	P410 - Protect from sunlight. P403 - Store in a well-ventilated place.
Disposal	Not assigned.
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
Isobutane	100	75-28-5 200-857-2	-	601-004-00-0	
Classification:		DSD: F+;R12			
		CLP: 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
Isobutane (CAS 75-28-5)	Ceiling	3800 mg/m ³
		1600 ppm
	MAK	1900 mg/m ³
		800 ppm

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

Components	Type	Value
Isobutane (CAS 75-28-5)	TWA	1900 mg/m ³
		800 ppm

Finland. Workplace Exposure Limits

Components	Type	Value
Isobutane (CAS 75-28-5)	STEL	2400 mg/m ³
		1000 ppm
		1900 mg/m ³
	TWA	800 ppm

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

Components	Type	Value
Isobutane (CAS 75-28-5)	TWA	2400 mg/m ³ 1000 ppm

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

Components	Type	Value
Isobutane (CAS 75-28-5)	AGW	2400 mg/m ³ 1000 ppm

Italy. OELs

Components	Type	Value
Isobutane (CAS 75-28-5)	TWA	1000 ppm

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

Components	Type	Value
Isobutane (CAS 75-28-5)	STEL	300 mg/m ³
	TWA	100 mg/m ³

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

Components	Type	Value
Isobutane (CAS 75-28-5)	TWA	1000 ppm

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

Components	Type	Value
Isobutane (CAS 75-28-5)	STEL	1500 mg/m ³
	TWA	1200 mg/m ³

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
Isobutane (CAS 75-28-5)	TWA	2400 mg/m ³ 1000 ppm

Spain. Occupational Exposure Limits

Components	Type	Value
Isobutane (CAS 75-28-5)	TWA	1000 ppm

Switzerland. SUVA Grenzwerte am Arbeitsplatz

Components	Type	Value
Isobutane (CAS 75-28-5)	STEL	7200 mg/m ³ 3200 ppm
	TWA	1900 mg/m ³ 800 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

Ingestion Not applicable.

Inhalation 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 can cause damage (frostbite) due to rapid evaporative cooling.

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

11.1. 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 vapourizing liquid may cause frostbite ("cold burn").

Skin corrosion/irritation Not assigned.

Serious eye damage/eye irritation Not assigned.

Respiratory sensitisation Not assigned.

Skin sensitisation Not available.

Germ cell mutagenicity Not assigned.

Carcinogenicity Not assigned.

Reproductive toxicity Not assigned.

Specific target organ toxicity - single exposure Not assigned.

Specific target organ toxicity - repeated exposure Not assigned.

Aspiration hazard Not applicable.

Mixture versus substance information Not available.

Other information Not available.

SECTION 12: Ecological information

12.1. Toxicity Not expected to be harmful to aquatic organisms.

12.2. Persistence and degradability Not available.

12.3. Bioaccumulative potential Not available.

Bioconcentration factor (BCF) Not available.

12.4. Mobility in soil Not available.

12.5. Results of PBT and vPvB assessment Not a PBT or vPvB substance or mixture.

12.6. Other adverse effects Not available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Residual waste Dispose of in accordance with local regulations.

Contaminated packaging Since emptied containers may retain product residue, follow label warnings even after container is emptied.

EU waste code 05 01 99

Disposal methods/information 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

14.1. UN number UN1969

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

RID

14.1. UN number	UN1969
14.2. UN proper shipping name	ISOBUTANE
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 for user	Not available.

ADN

14.1. UN number	UN1969
14.2. UN proper shipping name	Isobutane
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 for user	Not available.

IATA

14.1. UN number	UN1969
14.2. UN proper shipping name	Isobutane
14.3. Transport hazard class(es)	2.1
Subsidiary class(es)	-
14.4. Packing group	Not available.
14.5. Environmental hazards	Not available.
Labels required	Not available.
ERG code	10L
14.6. Special precautions for user	Not available.

IMDG

14.1. UN number	UN1969
14.2. UN proper shipping name	ISOBUTANE
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 for user	Not available.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

This substance/mixture is not intended to be transported in bulk.

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

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