

SAFETY DATA SHEET

Butane



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

1.1 Product identifier

Product name : Butane
Commercial name(s) : Aliphatic hydrocarbon.
REACH Registration number : Registration exempt under Regulation (EC) No. 1907/2006 (REACH), Annex V
Product code : MSDS-2
Other means of identification : n-Butane, dimethylmethane

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

Identified uses : Fuel.

1.3 Details of the supplier of the safety data sheet

Murco Petroleum Limited
 4 Beaconsfield Road
 St.Albans
 Hertfordshire
 AL1 3RH
 Tel: 01727 892400
 Web Site: <http://www.murco.co.uk/welcome.htm>

e-mail address of person responsible for this SDS : murco_msds@murphyoilcorp.com

1.4 Emergency telephone number

National advisory body/Poison Centre

Telephone number : Carechem24 Agreement through AEA Technology Plc who act through its National Emergency Centre.
 0870 190 6777
 (7/24)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Directive 1999/45/EC [DPD]

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

Classification : F+; R12

Physical/chemical hazards : Extremely flammable.

See Section 16 for the full text of the R phrases declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements

Hazard symbol or symbols : **F+**



Indication of danger : Extremely flammable



SECTION 2: Hazards identification

- Risk phrases** : R12- Extremely flammable.
- Safety phrases** : S9- Keep container in a well-ventilated place.
S16- Keep away from sources of ignition - No smoking.
S33- Take precautionary measures against static discharges.
- Supplemental label elements** : Not applicable.
- Special packaging requirements**
- Containers to be fitted with child-resistant fastenings** : Not applicable.
- Tactile warning of danger** : Not applicable.

2.3 Other hazards

- Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII** : Not applicable.
- Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII** : Not applicable.
- Other hazards which do not result in classification** : Not available.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance/preparation : Mixture

Ingredient name	CAS number	%	EC number	Classification
Butane	106-97-8	>=95	203-448-7	F+; R12 [2]
Pentane	109-66-0	< 5	203-692-4	F+; R12 [1] [2] Xn; R65 R66, R67 N; R51/53
Isobutane	75-28-5	< 2	200-857-2	F+; R12
See section 16 for the full text of the R-phrases declared above				

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

[1] Substance classified with a health or environmental hazard

[2] Substance with a workplace exposure limit

[3] PBT-substance

[4] vPvB-substance

Occupational exposure limits, if available, are listed in Section 8.

SECTION 4: First aid measures

4.1 Description of first aid measures

- Eye contact** : Immediately flush eyes with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. Get medical attention if symptoms occur.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 20 minutes. Get medical attention if symptoms occur.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Get medical attention immediately.
- Ingestion** : As this product is a gas, refer to the inhalation section.



SECTION 4: First aid measures

Protection of first-aiders : If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus.

4.2 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazardous combustion products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide

5.3 Advice for firefighters

Special precautions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : Accidental releases pose a serious fire or explosion hazard. Immediately contact emergency personnel. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also Section 8 for additional information on hygiene measures.

6.2 Environmental precautions : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

6.3 Methods and materials for containment and cleaning up

Small spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.

Large spill : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.



SECTION 6: Accidental release measures

- 6.4 Reference to other sections** : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid contact with eyes, skin and clothing. Avoid breathing gas. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container.

- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- 7.2 Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use.

7.3 Specific end use(s)

- Recommendations** : Not available.

- Industrial sector specific solutions** : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters

Occupational exposure limits

Product/ingredient name	Exposure limit values
Butane	EH40/2005 WELs (United Kingdom (UK), 8/2007). STEL: 1810 mg/m ³ 15 minute(s). Form: STEL: 750 ppm 15 minute(s). TWA: 1450 mg/m ³ 8 hour(s). TWA: 600 ppm 8 hour(s).
Pentane	EH40/2005 WELs (United Kingdom (UK), 8/2007). TWA: 600 ppm 8 hour(s). TWA: 1800 mg/m ³ 8 hour(s).

- Recommended monitoring procedures** : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances.

8.2 Exposure controls

**SECTION 8: Exposure controls/personal protection**

Appropriate engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Use explosion-proof ventilation equipment.

Individual protection measures

Hygiene measures : Ensure that eyewash stations and safety showers are close to the workstation location. Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.

Eye/face protection : Safety eyewear should be used when there is a likelihood of exposure. Recommended: Chemical splash goggles or face shield.

Skin protection

Hand protection : Use gloves appropriate for work or task being performed. Recommended: Thermally protective, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Recommended: Thermally protective and chemical resistant apron and long sleeves are recommended when volume of material is significant.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

SECTION 9: Physical and chemical properties**9.1 Information on basic physical and chemical properties****Appearance**

Physical state : Gas. [Compressed or Liquefied.]

Colour : Colourless.

Odour : Characteristic./Hydrocarbon. [Slight]

pH : Not applicable.

Melting point/freezing point : -138 to -135°C

Initial boiling point and boiling range : -12 to -1°C

Flash point : Closed cup: -107°C [Pensky-Martens.]

Evaporation rate : Not available.

Flammability : Not available.

Upper/lower flammability or explosive limits : Lower: 1.9%
Upper: 9%

Vapour pressure : Not available.

Vapour density : 1.9 to 2.1 [Air = 1]

Relative density : 0.57 to 0.575

Specific gravity : 0.57 to 0.575 g/cm³ [20°C (68°F)]

Solubility(ies) : Insoluble in water.

Partition coefficient: n-octanol/water : 2.68 to 2.81

Auto-ignition temperature : 450°C

Viscosity : Not available.

Explosive properties : Explosive in the presence of the following materials or conditions: open flames, sparks and static discharge and heat.



SECTION 9: Physical and chemical properties

9.2 Other information

No additional information.

SECTION 10: Stability and reactivity

10.1 Reactivity : No specific test data related to reactivity available for this product or its ingredients.

10.2 Chemical stability : The product is stable.

10.3 Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

10.4 Conditions to avoid : Avoid all possible sources of ignition (spark or flame). Do not pressurise, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

10.5 Incompatible materials : Strong oxidiser.

10.6 Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Butane	LC50 Inhalation Vapour	Rat	658000 mg/m3	4 hours
Pentane	LC50 Inhalation Vapour	Rat	364 g/m3	4 hours
	LD50 Oral	Rat	>2000 mg/kg	-
Isobutane	LC50 Inhalation Vapour	Rat	658000 mg/m3	4 hours

Information on the likely routes of exposure : Not available.

Potential acute health effects

Inhalation : No known significant effects or critical hazards.

Ingestion : As this product is a gas, refer to the inhalation section.

Skin contact : No known significant effects or critical hazards.

Eye contact : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : No specific data.

Ingestion : No specific data.

Skin contact : No specific data.

Eye contact : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

**SECTION 11: Toxicological information**

- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.
- Other information** : Not available.

SECTION 12: Ecological information**12.1 Toxicity**

- Remarks** : Volatilization from moist soil surfaces is expected to be an important fate process based upon an estimated Henry's Law constant of 0.95 atm·m³/mole. n-Butane is expected to volatilize from dry soil surfaces based upon its vapor pressure. While volatilization is expected to be the dominant fate process in both soil and water, n-butane is also susceptible to biodegradation processes.

12.2 Persistence and degradability

- Remarks** : Not available.

12.3 Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Butane	2.68 to 2.81	-	low

12.4 Mobility in soil

- Soil/water partition coefficient (K_{oc})** : Not available.
- Mobility** : Not available.

12.5 Results of PBT and vPvB assessment

- PBT** : Not applicable.
- vPvB** : Not applicable.

- 12.6 Other adverse effects** : No known significant effects or critical hazards.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods**Product**

- Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

- Hazardous waste** : The classification of the product may meet the criteria for a hazardous waste.

Packaging





- Methods of disposal** : The generation of waste should be avoided or minimised wherever possible. Empty pressure vessels should be returned to the supplier. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.



SECTION 13: Disposal considerations

Special precautions : This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

SECTION 14: Transport information

	ADR/RID	ADN/ADNR	IMDG	IATA
14.1 UN number	UN1075	UN1075	UN1075	UN1075
14.2 UN proper shipping name	LIQUEFIED PETROLEUM GAS	LIQUEFIED PETROLEUM GAS	LIQUEFIED PETROLEUM GAS	LIQUEFIED PETROLEUM GAS
14.3 Transport hazard class(es)	2 	2 	2.1 	2.1 
14.4 Packing group	-	-	-	-
14.5 Environmental hazards	No.	No.	No.	No.
14.6 Special precautions for user	Not available.	Not available.	Not available.	Not available.
Additional information	-	-	-	-

PG* : Packing group

Exemption to the above classification may apply.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH)

Annex XIV - List of substances subject to authorisation

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles : Not applicable.

Other EU regulations

Europe inventory : All components are listed or exempted.

Black List Chemicals : Not listed

Priority List Chemicals : Listed

Integrated pollution prevention and control list (IPPC) - Air : Not listed

Integrated pollution prevention and control list (IPPC) - Water : Not listed

Product/ingredient name	List name	Name on list	Classification	Notes
Butane	UK Occupational Exposure Limits EH40 - WEL	butane	Carc.	-

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

**SECTION 16: Other information**

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number

Full text of abbreviated R phrases : R12- Extremely flammable.
 R65- Harmful: may cause lung damage if swallowed.
 R66- Repeated exposure may cause skin dryness or cracking.
 R67- Vapours may cause drowsiness and dizziness.
 R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Full text of classifications [DSD/DPD] : F+ - Extremely flammable
 Xn - Harmful
 N - Dangerous for the environment

History

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Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.