

Butane

Print date 27.11.2023
Revision date 27.11.2023
Version 9.0 (en)
replaces version of 17.05.2017 (8.0)

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

*** 1.1 Product identifier**

Trade name/designation Butane
Art-Nr(n). 2313-2315, 70231
Substance name butane
INDEX No. 601-004-00-0
EC No. 203-448-7
REACH No. 01-2119474691-32
CAS No. 106-97-8

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

*** Use of the substance/mixture**

Fuel gas.
Basic substance
Refrigerant
Test gas.
Propellant gas.

*** 1.3 Details of the supplier of the safety data sheet**

Supplier

GHC Gerling, Holz & Co. Handels GmbH
Ruhrstraße 113
D-22761 Hamburg
Telephone +49 40 853 123 0
E-mail hamburg@ghc.de
Website www.ghc.com

Department responsible for information:
GHC Gerling, Holz & Co. Handels GmbH
Telephone +49 40 853 123 0

E-mail (competent person):
msds@ghc.de

*** 1.4 Emergency telephone number**

EN: Poison Information Center Mainz +49 6131 19240

*** SECTION 2: Hazards identification**

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP] Classification procedure

Flam. Gas 1A, H220
Press. Gas (Liq.), H280

Hazard statements for physical hazards

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

*** 2.2 Label elements**

*** Labelling according to Regulation (EC) No. 1272/2008 [CLP]**

Hazard pictograms



GHS02

Butane

Print date 27.11.2023
 Revision date 27.11.2023
 Version 9.0 (en)
 replaces version of 17.05.2017 (8.0)

Signal word

Danger

Hazard statements

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

Precautionary statements

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
 P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 P381 In case of leakage, eliminate all ignition sources.
 P403 Store in a well-ventilated place.

* **Supplemental hazard information**

EIGA0357 Asphyxiant in high concentrations.
 Please return container with residual pressure.

* **2.3 Other hazards*** **Adverse human health effects and symptoms**

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.

* **Other adverse effects**

The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

* **Results of PBT and vPvB assessment**

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

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

Substance name	butane
INDEX No.	601-004-00-0
EC No.	203-448-7
REACH No.	01-2119474691-32
CAS No.	106-97-8

* **Additional information**

Content: >= 99 %

* **3.2 Mixtures**

not applicable

* **SECTION 4: First aid measures*** **4.1 Description of first aid measures*** **General information**

Remove contaminated, saturated clothing immediately.
 In the event of persistent symptoms obtain medical treatment.
 First aider: Pay attention to self-protection!

* **Following inhalation**

Remove casualty to fresh air and keep warm and at rest.
 In case of respiratory standstill give artificial respiration by respiratory bag (Ambu bag) or respirator. Obtain medical assistance.

* **Following skin contact**

In case of skin contact rinse with warm water.
 In case of frostbite, wash with plenty of water; do not remove clothing.

Butane

Print date 27.11.2023
Revision date 27.11.2023
Version 9.0 (en)
replaces version of 17.05.2017 (8.0)

-
- * **After eye contact**
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical assistance.

 - Following ingestion**
Ingestion is not considered a potential route of exposure.

 - * **4.2 Most important symptoms and effects, both acute and delayed**
 - * **Symptoms**
Frostbite
Cardiac arrhythmias
Dizziness

 - * **4.3 Indication of any immediate medical attention and special treatment needed**
 - * **Notes for the doctor**
Treat symptomatically.
To supervise the blood circulation.
Do not apply drugs of the adrenaline ephedrine group.

 - * **SECTION 5: Firefighting measures**
 - * **5.1 Extinguishing media**
 - * **Suitable extinguishing media**
Water spray jet
Extinguishing powder

 - * **Unsuitable extinguishing media**
Carbon dioxide (CO₂)
Full water jet

 - * **5.2 Special hazards arising from the substance or mixture**
 - * **Hazardous combustion products**
Formation of explosive gas mixtures in contact with air.
In case of fire formation of dangerous gases possible.
Carbon dioxide (CO₂)
Carbon monoxide

 - * **5.3 Advice for firefighters**
 - * **Special protective equipment for firefighters**
Wear a self-contained breathing apparatus and chemical protective clothing.

 - * **Additional information**
If possible, shut off gas valves and move containers to a safe location.
Use water spray jet to protect personnel and to cool endangered containers.
Exposure to fire may cause rupture / explosion of the containers.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire.
Dispose of fire residues and contaminated extinguishing water in accordance with local, official regulations.

 - * **SECTION 6: Accidental release measures**
 - * **6.1 Personal precautions, protective equipment and emergency procedures**
 - * **For non-emergency personnel**
Use personal protection equipment.
Leave the danger area.
Keep people away and stay on the upwind side.

 - * **For emergency responders**
Personal protection by wearing close-fitting protective clothing and breathing apparatus.
Pay attention to extension of gas especially at ground (heavier than air) and in direction of the wind.
Eliminate all ignition sources if safe to do so.
Remove persons to safety.

Butane

Print date 27.11.2023
Revision date 27.11.2023
Version 9.0 (en)
replaces version of 17.05.2017 (8.0)

* **6.2 Environmental precautions**

If possible, stop flow of product.
Do not allow to enter into soil/subsoil.
Do not allow to enter into surface water or drains.

* **6.3 Methods and material for containment and cleaning up**

* **For containment**

If necessary, secure leaky pressure receptacles using a salvage container.
Prevent the liquid from spreading over a wide area (set up barriers, cover sewage systems).
Limit expansion of the gas (water spray jet).

* **For cleaning up**

Leave to vapourize.
Provide adequate ventilation.

* **6.4 Reference to other sections**

Disposal: see section 13
Personal protection equipment: see section 8

* **SECTION 7: Handling and storage**

* **7.1 Precautions for safe handling**

* **Protective measures**

Use only in well-ventilated areas.
Transfer and handle product only in closed systems.
Usual measures for fire prevention.
Containers' temperature should not be increased above 50 °C.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
Prevent cylinders from falling over.
Take precautionary measures against static discharges. Ground barrels and installations. Use only antistatically equipped (spark-free) tools.
Use explosion-proof machinery, apparatus, ventilation facilities, tools etc.
Ensure valve protection device is correctly fitted.
Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
Open valve slowly to avoid pressure shock.
Do not allow backflow into the container.
Entering of water into the container must be prevented.
No water to valves, flanges and other fittings.
Purging of pipes and valves with inert gases - to avoid: water, solvents.

* **Advices on general occupational hygiene**

When using do not eat, drink, smoke, sniff.
Wash hands before breaks and after work.
Remove contaminated clothing and protective equipment before entering eating areas.

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

* **Requirements for storage rooms and vessels**

All regulations and local requirements for the storage of containers have to be respected.
Keep container tightly closed and in a well-ventilated place.
Containers' temperature should not be increased above 50 °C.
Prevent cylinders from falling over.
Only use containers specifically approved for the substance/product.
Information on suitable materials for receptacles and valves see ISO 11114.

Storage class

2A Gases (except aerosol dispensers and lighters)

Butane

Print date 27.11.2023
 Revision date 27.11.2023
 Version 9.0 (en)
 replaces version of 17.05.2017 (8.0)

- * **Materials to avoid**
 Do not store together with explosives.
 Do not store together with flammable liquids.
 Do not store together with flammable solids.
 Do not store together with pyrophoric and self-heating substances.
 Do not store together with oxidizing liquids or oxidizing solids.
 Do not store together with toxic liquids or toxic solids.
 Do not store together with infectious substances.
 Do not store together with radioactive material.
 Do not store together with food or feed.

7.3 Specific end use(s)**Recommendation**

See section 1.2

* **SECTION 8: Exposure controls/personal protection*** **8.1 Control parameters*** **Occupational exposure limit values**

CAS No.	EC No.	Substance name	occupational exposure limit value
106-97-8	203-448-7	Butane, all isomers	Short-term(ml/m ³) 1000 (1) (1) 15 minutes average value (IE)

* **8.2 Exposure controls*** **Appropriate engineering controls**

- * **Technical measures to prevent exposure**
 Transfer and handle only in enclosed systems.

* **Personal protection equipment**

- * **Eye/face protection**
 Protective goggles according to EN 166, in case of increased risk add protective face shield.

- * **Hand protection**
 Safety gloves according to EN 388:
 Chromate-free leather

- * **Body protection:**
 Safety shoes with steel toecap.
 Body covering work clothing or chemical resistant suit at increased risk.

- * **Respiratory protection**
 Keep self contained breathing apparatus readily available for emergency use.
 Respiratory protection complying with EN 137.
 Short term: filter apparatus, filter AX
 In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation due to displacement of oxygen.

* **Environmental exposure controls**

- * **Remark**
 Prevent release to the environment.

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

Gaseous / liquefied under pressure.

Colour

colourless

Butane

Print date 27.11.2023
 Revision date 27.11.2023
 Version 9.0 (en)
 replaces version of 17.05.2017 (8.0)

* **Odour**
 hardly noticeable

Safety relevant basis data

	Value	Method	Source, Remark
Odour threshold:			not determined
Melting point/freezing point	Melting point -138.3 °C		
Boiling point or initial boiling point and boiling range	-0.5 °C		
flammability			Extremely flammable gas (H220).
Lower and upper explosion limit	Upper explosion limit 9.4 Vol-%		
Lower and upper explosion limit	Lower explosion limit 1.4 Vol-%		
Flash point			not applicable
Auto-ignition temperature	365 °C		
Decomposition temperature			No decomposition if used as directed.
pH			not applicable
Viscosity			not applicable
Solubility(ies)	Water solubility 61 mg/L (20°C)		
Partition coefficient n-octanol/water (log value)	2.89		
Vapour pressure	2100 hPa (20°C)		
Density and/or relative density			not applicable
Relative vapour density	2.1		air = 1
particle characteristics			not applicable

* **9.2 Other information*** **Information with regard to physical hazard classes*** **Gases under pressure****Safety characteristics**

	Value	Method, Result	Source, Remark
Critical temperature	152 °C		

* **Other information**
 Vapours are heavier than air.

* **SECTION 10: Stability and reactivity****10.1 Reactivity**

See section "Possibility of hazardous reactions".

* **10.2 Chemical stability**

The substance is chemically stable under recommended conditions of storage, use and temperature.

* **10.3 Possibility of hazardous reactions**

Formation of explosive mixtures with:
 Air
 Oxidising agent

Butane

Print date 27.11.2023
 Revision date 27.11.2023
 Version 9.0 (en)
 replaces version of 17.05.2017 (8.0)

*** 10.4 Conditions to avoid**

Heat sources / heat - risk of bursting.
 Ignition sources, open flames, glowing metal surfaces, etc.

*** 10.5 Incompatible materials**

Oxygen
 Oxidising agent

*** 10.6 Hazardous decomposition products**

When handled and stored appropriately, no dangerous decomposition products are known.

*** SECTION 11: Toxicological information****11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008***** Acute toxicity***** Animal data**

	Effective dose	Method, Evaluation	Source, Remark
Acute oral toxicity			Study technically not feasible.
Acute dermal toxicity			Study technically not feasible.
Acute inhalation toxicity	Acute inhalation toxicity (gas) 520400 ppm Species Mouse Exposure time 120 min	LC50	Data refer to isobutane.

Assessment/classification

Based on available data, the classification criteria are not met.

*** Skin corrosion/irritation***** Other information**

Study technically not feasible.

*** Serious eye damage/irritation***** Other information**

Study technically not feasible.

*** Sensitisation to the respiratory tract***** Other information**

No data available

*** Skin sensitisation***** Other information**

Study technically not feasible.

Germ cell mutagenicity

	Value	Method	Result / Evaluation	Remark
In vitro mutagenicity/genotoxicity			No mutagenity, after different in-vitro studies.	

Assessment/classification

Based on available data, the classification criteria are not met.

*** Carcinogenicity****Other information**

Study scientifically not necessary.

Butane

Print date 27.11.2023
 Revision date 27.11.2023
 Version 9.0 (en)
 replaces version of 17.05.2017 (8.0)

* **Reproductive toxicity****Animal data**

	Value	Method	Result / Evaluation	Remark
Reproductive toxicity	inhalative NOAEC 9000 ppm Species Rat	OECD 422		Data refer to isobutane.

Assessment/classification

Based on available data, the classification criteria are not met.

* **STOT-single exposure*** **STOT SE 1 and 2*** **Assessment/classification**

Based on available data, the classification criteria are not met.

* **STOT-repeated exposure*** **Animal data**

	Effective dose	Method	Specific effects:	Organs affected:	Source, Remark
Inhalative specific target organ toxicity (repeated exposure)	NOAEL(C): 9000 ppm Species Rat Exposure time 56 d	OECD 422			

* **Assessment/classification**

Based on available data, the classification criteria are not met.

* **Aspiration hazard*** **Remark**

Study technically not feasible.

11.2 Information on other hazards* **Other information**

Inhalation causes narcotic effects/intoxication.

* **SECTION 12: Ecological information*** **12.1 Toxicity*** **Aquatic toxicity**

	Effective dose	Method, Evaluation	Source, Remark
Acute (short-term) fish toxicity	LC50: 24.11 mg/L Species Fish Test duration 96 h	QSAR	
Chronic (long-term) fish toxicity	not determined		
Acute (short-term) toxicity to crustacea	LC50 14.22 mg/L Species Daphnia sp. Test duration 48 h	QSAR	
Chronic (long-term) toxicity to aquatic invertebrate	not determined		
Acute (short-term) toxicity to algae and cyanobacteria	EC50 7.71 mg/L Species Algae Test duration 96 h	QSAR	
Chronic (long-term) toxicity to aquatic algae and cyanobacteria	not determined		
Toxicity to other aquatic plants/organisms	not determined		
Toxicity to microorganisms	not determined		

Butane

Print date 27.11.2023
 Revision date 27.11.2023
 Version 9.0 (en)
 replaces version of 17.05.2017 (8.0)

* **12.2 Persistence and degradability**

	Value	Method	Source, Remark
Biodegradation	Degradation rate 50 % Test duration 3.46 d	QSAR	

* **Assessment/classification**
 Readily biodegradable (according to OECD criteria).

* **12.3 Bioaccumulative potential**

* **Assessment/classification**
 Based on the n-octanol/water partition coefficient accumulation in organisms is not expected.

12.4 Mobility in soil

Assessment/classification
 Due to its high volatility, the product is unlikely to cause soil or water pollution.

* **12.5 Results of PBT and vPvB assessment**

The substance/mixture does not contain components meeting the PBT/vPvB criteria of the Reach Regulation, Annex XIII, at levels of 0.1% or higher.

* **12.6 Endocrine disrupting properties**

	Effective dose	Method, Evaluation	Source, Remark
Endocrine disrupting properties			See section 2.3

* **12.7 Other adverse effects**

	Value	Method	Source, Remark
Global warming potential (GWP)	4		

* **SECTION 13: Disposal considerations*** **13.1 Waste treatment methods****Waste codes/waste designations according to EWC/AVV**

Waste code product	Waste name
160504 *	gases in pressure containers (including halons) containing hazardous substances

* **Appropriate disposal / Product**
 Waste disposal according to directive 2008/98/EC, covering waste and dangerous waste.
 Prevent release to the environment. No disposal via the sewage.
 Disposal according to local regulations.

Appropriate disposal / Package
 Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

* **SECTION 14: Transport information**

	Land transport (ADR/RID)	Sea transport (IMDG)	Air transport (ICAO-TI / IATA-DGR)
14.1 UN number or ID number	UN 1011	UN 1011	UN 1011
14.2 UN proper shipping name	BUTANE	BUTANE	Butane
14.3 Transport hazard class(es)	2.1	2.1	2.1
14.4 Packing group	-	-	-
14.5 Environmental hazards	No	No	No

14.6 Special precautions for user

The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

Butane

Print date 27.11.2023
 Revision date 27.11.2023
 Version 9.0 (en)
 replaces version of 17.05.2017 (8.0)

14.7 Maritime transport in bulk according to IMO instruments

No carriage in bulk.

Land transport (ADR/RID)

UN number or ID number	UN 1011
UN proper shipping name	BUTANE
Transport hazard class(es)	2.1
Hazard label(s)	2.1
Classification code	2F
Packing group	-
Environmental hazards	No
Limited quantity (LQ)	0
Special provisions	392, 652, 657, 662, 674
Tunnel restriction code	B/D

*** Sea transport (IMDG)**

UN number or ID number	UN 1011
UN proper shipping name	BUTANE
Transport hazard class(es)	2.1
Packing group	-
Environmental hazards	No
Limited quantity (LQ)	0
Marine pollutant	No
EmS	F-D, S-U

Air transport (ICAO-TI / IATA-DGR)

UN number or ID number	UN 1011
UN proper shipping name	Butane
Transport hazard class(es)	2.1
Packing group	-
Environmental hazards	No

*** SECTION 15: Regulatory information***** 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture***** EU legislation***** Restrictions of occupation**

Observe employment restrictions under the Maternity Protection Directive (92/85/EEC) for expectant or nursing mothers.
 Observe restrictions to employment for juvenils according to the 'juvenile work protection guideline' (94/33/EC).

*** Other regulations (EU)****To follow:**

Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.
 Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.
 National and local regulations concerning chemicals shall be observed.

Butane

Print date 27.11.2023
Revision date 27.11.2023
Version 9.0 (en)
replaces version of 17.05.2017 (8.0)

* **Directive 2010/75/EU on industrial emissions [Industrial Emissions Directive] VOC**
VOC-value \geq 99 %

* **15.2 Chemical Safety Assessment**

* **National regulations**

For this substance a chemical safety assessment has been carried out.

* **SECTION 16: Other information**

* **Key literature references and sources for data**

Information from our suppliers and data from the "GESTIS Substances Database" and the "Registered Substances" database of the European Chemicals Agency (ECHA) were used to create this safety data sheet.

* **Additional information**

The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Relevant H- and EUH-phrases (Number and full text)

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

Indication of changes

* Data changed compared with the previous version