

SECTION 1: Identification

1.1. GHS Product identifier

Product form	: Substance
Trade name	: 1,3-butadiene
Chemical name	: 1,3-butadiene
CAS-No.	: 106-99-0
Formula	: C ₄ H ₆
Product code	: P056

1.2. Other means of identification

REACH registration No.	: 01-2119471988-16-xxxx
EC Index-No.	: 601-013-00-X
EC-No.	: 203-450-8

1.3. Recommended use of the chemical and restrictions on use

Recommended use	: Manufacture of rubber products
Restrictions on use	: No additional information available

1.4. Supplier's details

Braskem S.A.
Rua Eteno, 1561, Polo Petroquímico de Camaçari
Camaçari, BA, CEP: 42810-000, Brasil
Tel: +55 (71) 3413-3600
productsafety@braskem.com

1.5. Emergency phone number

Emergency number	: CHEMTREC Brasil (Rio De Janeiro): +(55)-2139581449 Portuguese CHEMTREC Brasil (São Paulo): +(55)-1143491359 Portuguese CHEMTREC Brasil: 0800 892 0479 Portuguese CHEMTREC International: +1 703-741-5970
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SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

Classification according to GHS BR (ABNT NBR 14725:2023)

Flammable gases, Category 1A
Gases under pressure : Liquefied gas
Germ cell mutagenicity, Category 1B
Carcinogenicity, Category 1A
Hazardous to the aquatic environment - Acute Hazard, Category 3

2.2. GHS Label elements, including precautionary statements

GHS BR labelling

Hazard pictograms (GHS BR)



Signal word (GHS BR)

: Danger

Hazard statements (GHS BR)

: H220 - Extremely flammable gas
H280 - Contains gas under pressure; may explode if heated
H340 - May cause genetic defects.
H350 - May cause cancer.
H402 - Harmful to aquatic life

Precautionary statements (GHS BR)

: P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.

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No smoking.
P273 - Avoid release to the environment.
P280 - Wear eye protection, protective clothing, protective gloves.
P308+P313 - IF exposed or concerned: Get medical attention.
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.
P405 - Store locked up.
P410+P403 - Protect from sunlight. Store in a well-ventilated place.
P501 - Dispose of contents and/or container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulations.

2.3. Other hazards which do not result in classification

May cause frostbite on contact with liquefied gas, In high concentrations may cause asphyxiation

SECTION 3: Composition/information on ingredients

3.1. Substances

Name	: 1,3-Butadiene
CAS-No.	: 106-99-0
EC-No.	: 203-450-8
EC Index-No.	: 601-013-00-X
Formula	: C ₄ H ₆
Concentration	: >= 99%

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of necessary first-aid measures

First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Seek medical attention immediately.
First-aid measures after skin contact	: Remove contaminated clothing and shoes. Rinse immediately with plenty of water (for at least 15 minutes). Do not remove clothing adhering to the skin. Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.
First-aid measures after eye contact	: Immediately rinse with water for a prolonged period while holding the eyelids wide open. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.

4.2. Most important symptoms and effects, acute and delayed

Symptoms/effects after inhalation	: May cause irritation to the respiratory tract. irritation of mucous membranes. Asphyxiant in high concentrations. Excessive concentrations may cause nervous system depression, headache, and weakness leading to unconsciousness.
Symptoms/effects after skin contact	: Repeated exposure may cause skin dryness or cracking. Skin rash/inflammation. Contact with the product may cause cold burns or frostbite.
Symptoms/effects after eye contact	: Contact with the liquid may cause frostbite and serious damage to eyes.
Symptoms/effects after ingestion	: Ingestion is not considered a potential route of exposure.
Chronic symptoms	: May cause cancer. May cause genetic defects.

4.3. Indication of any immediate medical attention and special treatment needed, if necessary

Note to physician :	: Treat symptomatically.
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SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media	: Carbon dioxide (CO ₂), dry chemical powder, foam. Water.
Unsuitable extinguishing media	: None known.

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5.2. Specific hazards arising from the chemical

- Fire hazard : Extremely flammable gas. The gas mixes well with air, explosive mixtures are easily formed. On combustion forms: Carbon dioxide. Carbon monoxide.
- Explosion hazard : Explosive. Prolonged exposure to fire may cause containers to rupture/explode.

5.3. Special protective actions for fire-fighters

- Firefighting instructions : Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Cool closed containers exposed to fire with water spray. Keep upwind.
- Protective equipment for firefighters : Extra personal protection: complete protective clothing including self-contained breathing apparatus. For further information refer to section 8: "Exposure controls/personal protection".

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

- General measures : Limit access only to the necessary cleaning personnel.
- 6.1.1. For non-emergency personnel**
- Protective equipment : Wear suitable protective clothing, gloves and eye/face protection. For further information refer to section 8: "Exposure controls/personal protection".
- Emergency procedures : Evacuate unnecessary personnel. No flames, no sparks. Eliminate all sources of ignition.
- 6.1.2. For emergency responders**
- Protective equipment : Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".
- Emergency procedures : Stop leak without risks if possible. Eliminate every possible source of ignition. Ventilate area. Use ventilation/water spray/fog to disperse vapours.

6.2. Environmental precautions

Avoid discharge to the environment. Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and materials for containment and cleaning up

- For containment : Ventilate spillage area. Stop leak without risks if possible.
- Methods for cleaning up : Ventilate spillage area. Use water spray to disperse the vapours.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

- Precautions for safe handling : Use only non-sparking tools. Use grounded electrical/mechanical equipment. Ground/bond container and receiving equipment. Do not use compressed air to transfer, discharge or transport the product. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Hygiene measures : Remove contaminated clothes. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke in areas where product is used.

7.2. Conditions for safe storage, including any incompatibilities

- Technical measures : Use only non-sparking tools. Use only explosion-proof equipment. Provide adequate ventilation. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.
- Storage conditions : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Store only in a limited quantity. Store in dry, cool, well-ventilated area. Keep the cylinders at vertical position, fixed to the wall or other solid structure. Keep container closed when not in use.
- Incompatible materials : air or oxygen. Strong oxidizing agents. copper. Monel alloy, aluminum tetrahydroborate, vinylacetylene, chrome-aldehyde, boron trifluoride, phenol, concentrated solutions of sodium nitrite(5%), halogen.
- Packaging materials : Carbon steel. Stainless steel.

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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

1,3-butadiene (106-99-0)	
Brazil - Occupational Exposure Limits	
Local name	1,3 Butadieno
OEL TWA	1720 mg/m³
	780 ppm
Regulatory reference	Norma Regulamentadora Nº 15 - Atividades e Operações Insalubres
Brazil - Biological limit values	
Local name	1,3 butadieno
BEI	2.5 mg/l Parâmetro: 1,2 dihidro-4(n-acetilcisteína) butano - Meio: Urina - Momento de amostragem: Final de jornada de trabalho - Observações: Encontrado em populações não expostas ocupacionalmente.
Remark	Interpretação: IBE/EE - Indicadores Biológicos de Exposição Excessiva.
Regulatory reference	NR 7 - PCMSO
USA - ACGIH - Occupational Exposure Limits	
Local name	1,3-Butadiene
ACGIH OEL TWA	2 ppm
Remark (ACGIH)	TLV® Basis: Cancer. Notations: A2 (Suspected Human Carcinogen)
Regulatory reference	ACGIH 2024
USA - ACGIH - Biological Exposure Indices	
Local name	1,3-Butadiene
BEI	2.5 mg/l Parameter: 1,2 Dihydroxy-4-(N-acetylcystenyl)-butane - Medium: urine - Sampling time: End of shift - Notations: B, Sq 2.5 pmol/g hemoglobin Parameter: Mixture of N-1 and N-2-(Hydroxybutenyl) valine hemoglobin (Hb) adductus - Medium: blood - Sampling time: Not critical - Notations: Sq
Regulatory reference	ACGIH 2024

8.2. Appropriate engineering controls

Appropriate engineering controls : Provide local exhaust or general room ventilation to minimize vapour concentrations. Use only non-sparking tools. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

8.3. Individual protection measures

Hand protection:
Protective gloves made of PVC. It is recommended that the glove supplier be consulted to ensure the protective gloves are resistant to chemicals in this product
Eye protection:
Contact lenses should not be worn. Safety glasses with side guards should be worn to prevent injury from airborne particles and/or other eye contact with this product
Skin and body protection:
Wear suitable protective clothing

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Respiratory protection:

An approved organic vapour respirator/supplied air or self-contained breathing apparatus must be used when vapour concentration exceeds applicable exposure limits

Thermal hazard protection:

Wear cold insulating gloves and either face shield or eye protection.

SECTION 9: Physical and chemical properties

9.1. Basic physical and chemical properties

Physical state	: Gas
Appearance	: Clear.
Colour	: Colourless
Odour	: Faint aromatic,Gasoline
Odour threshold	: Not available
pH	: Not applicable
Melting point	: -108.9 °C
Freezing point	: Not applicable
Boiling point	: -4.5 °C
Flash point	: -76 °C
Relative evaporation rate (butylacetate=1)	: Not available
Relative evaporation rate (ether=1)	: > 25
Flammability	: Not available
Explosive limits	: 1,4 – 16,3 vol.%
Vapour pressure	: 273.6 kPa (2052 mm Hg) (25 °C)
Relative vapour density at 20°C	: 1.87
Relative density	: 0.6
Density	: 0.6149 g/cm³ (25 °C)
Solubility	: Slightly soluble in: Ethanol. Methanol. Water: 735 mg/l (20 °C) Organic solvent:Soluble
Partition coefficient n-octanol/water (Log Kow)	: 1.724 – 2.132
Auto-ignition temperature	: 420 °C (788 °F)
Decomposition temperature	: Not available
Viscosity, kinematic	: Not applicable
Viscosity, dynamic	: 0.33 cP (-40 °C); Liquid
Particle size	: Not applicable
Particle size distribution	: Not applicable
Particle shape	: Not applicable
Particle aspect ratio	: Not applicable
Particle specific surface area	: Not applicable

9.2. Data relevant with regard to physical hazard classes

No additional information available

9.3. Further safety characteristics

No additional information available

SECTION 10: Stability and reactivity

Chemical stability	: Materials that are normally stable but can become unstable (self-react) at high temperatures and pressures. Materials may react non-violently with water or undergo hazardous polymerization in the absence of inhibitors.
Conditions to avoid	: Keep away from open flames, hot surfaces and sources of ignition. Avoid static electricity discharges.
Hazardous decomposition products	: Incomplete combustion releases dangerous carbon monoxide, carbon dioxide and other toxic gases.
Incompatible materials	: air or oxygen. Strong oxidizing agents. Copper (Cu). Monel alloy, aluminum tetrahydroborate, vinylacetylene, chrome-aldehyde, boron trifluoride, phenol, concentrated solutions of sodium nitrite(5%), halogen.
Possibility of hazardous reactions	: Extreme risk of explosion by shock, friction, fire or other sources of ignition. Hazardous polymerization may occur if exposed to high temperature.

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Reactivity : At high temperatures : Polymerisation can occur.
Handling temperature : No additional information available

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not available
Acute toxicity (dermal) : Not available
Acute toxicity (inhalation) : Not available

1,3-butadiene (106-99-0)	
LD50 oral rat	5480 mg/kg (Source: NLM_CIP)
Skin corrosion/irritation	: Not available
Serious eye damage/irritation	: Not available
Respiratory or skin sensitisation	: Not available
Germ cell mutagenicity	: May cause genetic defects.
Carcinogenicity	: May cause cancer.
IARC group	: 1 - Carcinogenic to humans
Reproductive toxicity	: Not available
STOT-single exposure	: Not available
STOT-repeated exposure	: Not available
Aspiration hazard	: Not applicable
Other information	: Likely routes of exposure: inhalation, skin and eye.

11.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects after inhalation : May cause irritation to the respiratory tract. irritation of mucous membranes. Asphyxiant in high concentrations. Excessive concentrations may cause nervous system depression, headache, and weakness leading to unconsciousness.

Symptoms/effects after skin contact : Repeated exposure may cause skin dryness or cracking. Skin rash/inflammation. Contact with the product may cause cold burns or frostbite.

Symptoms/effects after eye contact : Contact with the liquid may cause frostbite and serious damage to eyes.

Symptoms/effects after ingestion : Ingestion is not considered a potential route of exposure.

Chronic symptoms : May cause cancer. May cause genetic defects.

SECTION 12: Ecological information

12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute) : Harmful to aquatic life.
Hazardous to the aquatic environment, long-term (chronic) : Not available

1,3-butadiene (106-99-0)	
LC50 - Fish [1]	34.555 mg/l freshwater fish
EC50 - Crustacea [1]	64.642 mg/l aquatic invertebrates (freshwater)
ErC50 algae	35.77 mg/l Algae (freshwater)

12.2. Persistence and degradability

1,3-butadiene (106-99-0)	
Persistence and degradability	not persistent.

12.3. Bioaccumulative potential

1,3-butadiene (106-99-0)	
BCF - Fish [1]	13 – 19.1
Partition coefficient n-octanol/water (Log Kow)	1.724 – 2.132

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12.4. Mobility in soil

No additional information available

12.5. Other adverse effects

Hazardous to the ozone layer : Not available

SECTION 13: Disposal considerations

Regional legislation (waste) : Disposal must be done according to official regulations. Consult an expert on waste disposal or treatment.




Product/Packaging disposal recommendations : Dispose of this material and its container at hazardous or special waste collection point.

Additional information : Do not re-use empty containers. Container remains hazardous when empty. Continue to observe all precautions.

SECTION 14: Transport information

14.1 National and international Regulations

In accordance with IMDG / IATA / ANTT

ANTT	IMDG	IATA
UN number		
1010	1010	1010
UN Proper Shipping Name		
BUTADIENOS, ESTABILIZADOS	BUTADIENES, STABILIZED	Butadienes, stabilized
Primary risk class/subclass		
2.1	2.1	2.1
Subsidiary risk class/subclass		
Not applicable	Not applicable	Not applicable
Hazard labels		
2.1	2.1	2.1
		
Risk Identification Number		
239	Not applicable	Not applicable
Packing group		
Not applicable	Not applicable	Not applicable
Environmental hazards		
No	No Marine pollutant: No	No
Transport in bulk according to SOLAS/74 and IGC Code:		
Not applicable	Product name: BUTADIENE Ship type: 2 G/2 PG	Not applicable

14.2 Other information

This information does not intend to convey all specific regulatory or operational requirements/information with regards to the product, therefore it cannot be considered exhaustive. Consult ANTT, IMO and ICAO instructions before transporting the product. The carrier is responsible for following all applicable laws, regulations and rules related to the product transportation.

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SECTION 15: Regulatory information

15.1. National regulations

Regulatory reference : Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active
Listed on the Canadian DSL (Domestic Substances List)
Listed on IARC (International Agency for Research on Cancer)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed as carcinogen on NTP (National Toxicology Program)
Subject to reporting requirements of United States SARA Section 313
Listed on EPA Hazardous Air Pollutant (HAPS)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Japanese ENCS (Existing New Chemical Substances) inventory
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Japanese Pollutant Release and Transfer Register Law (PRTR Law)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)
Listed on the NCI (Vietnam - National Chemical Inventory)
Listed on Thailand Existing Chemicals Inventory (DIW)

SECTION 16: Other information

Other information : None.

Safety Data Sheet (SDS), Brazil - Braskem

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. It warns that the handling of any chemical substance requires the previous knowledge of its hazards for the user. It is up to the user of the product company providing this SDS to and promote the training of its employees about possible risks come upon of the product. The information contained herein is not absolute, but only general information on the use of the chemical and indication of safety and security measures.