

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

SECTION 1. IDENTIFICATION

Product name : BD3 Butylenes

Product code : X2508

Manufacturer or supplier's details

Company : **Shell Chemical LP**
PO Box 576
HOUSTON TX 77001
USA

SDS Request : 1-800-240-6737
Customer Service : 1-855-697-4355

Emergency telephone number

Chemtrec Domestic (24 hr) : 1-800-424-9300
Chemtrec International (24 hr) : 1-703-527-3887

Recommended use of the chemical and restrictions on use

Recommended use : Base chemical., Raw material for use in the chemical industry.

Restrictions on use : This product must not be used in applications other than the above without first seeking the advice of the supplier.

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with 29 CFR 1910.1200

Flammable gases : Category 1
Gases under pressure : Liquefied gas
Germ cell mutagenicity : Category 1B
Carcinogenicity : Category 1A

GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : PHYSICAL HAZARDS:

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.
HEALTH HAZARDS:
H340 May cause genetic defects.
H350 May cause cancer.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

Precautionary statements

: **Prevention:**
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P243 Take precautionary measures against static discharge.
P280 Wear protective gloves/ protective clothing/ eye protection/ face protection.
Response:
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 Eliminate all ignition sources if safe to do so.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
Storage:
P410 + P403 Protect from sunlight. Store in a well-ventilated place.
P405 Store locked up.
Disposal:
P501 Dispose of contents and container to appropriate waste site or reclaimer in accordance with local and national regulations.

Other hazards which do not result in classification

Vapours may cause drowsiness and dizziness.
Slightly irritating to respiratory system.
Exposure to rapidly expanding gases may cause frost burns to eyes and/or skin.
Vapours may be irritating to the eye.
Possibility of organ or organ system damage from prolonged exposure; see Chapter 11 for details. Target organ(s):
Blood forming organs
Reproductive system.
This material is a static accumulator.
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.
Highly reactive.
May form explosive peroxides.

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version 13.0 Revision Date: 06/05/2018 SDS Number: 800001008859 Print Date: 09/03/2022
Date of last issue: 07/25/2016

The vapour is heavier than air, spreads along the ground and distant ignition is possible.
May form flammable/explosive vapour-air mixture.
The classification of this material is based on OSHA HCS 2012 criteria.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components

Chemical name	Synonyms	CAS-No.	Concentration (% w/w)
hydrocarbons, C1-4, debutanizer fraction	Hydrocarbons, C1-4, debutanizer fraction	68527-19-5	≥ 98
isobutane	isobutane (Gas)	75-28-5	≤ 42
2-methylpropene	2-methylpropene	115-11-7	$\geq 9 - \leq 40$
butane	butane (Gas)	106-97-8	$\geq 5 - \leq 40$
but-1-ene	but-1-ene	106-98-9	$\geq 10 - \leq 38$
trans-2-Butene	(E)-but-2-ene	624-64-6	$\geq 5 - \leq 18$
(Z)-but-2-ene	(Z)-but-2-ene	590-18-1	≤ 15
allene (Stabilized)	allene (Stabilized)	463-49-0	≤ 1

Further information

Contains:

Chemical name	Identification number	Concentration [%]
1,3-butadiene	106-99-0, 203-450-8	- ≤ 0.6

SECTION 4. FIRST-AID MEASURES

- General advice : Not expected to be a health hazard when used under normal conditions.
- If inhaled : Call emergency number for your location / facility.
Remove to fresh air. Do not attempt to rescue the victim unless proper respiratory protection is worn. If the victim has difficulty breathing or tightness of the chest, is dizzy, vomiting, or unresponsive, give 100% oxygen with rescue breathing or Cardio-Pulmonary Resuscitation as required and transport to the nearest medical facility.
- In case of skin contact : Slowly warm the exposed area by rinsing with warm water.
Transport to the nearest medical facility for additional treatment.
- In case of eye contact : Slowly warm the exposed area by rinsing with warm water.
Transport to the nearest medical facility for additional treatment.
- If swallowed : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

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| Most important symptoms and effects, both acute and delayed | : Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision.
Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters.
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination.
Continued inhalation may result in unconsciousness and death. |
| Protection of first-aiders | : When administering first aid, ensure that you are wearing the appropriate personal protective equipment according to the incident, injury and surroundings. |
| Indication of any immediate medical attention and special treatment needed | : Potential for cardiac sensitisation, particularly in abuse situations. Hypoxia or negative inotropes may enhance these effects. Consider: oxygen therapy. |

SECTION 5. FIRE-FIGHTING MEASURES

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|---|---|
| Suitable extinguishing media | : Shut off supply. If not possible and no risk to surroundings, let the fire burn itself out. |
| Unsuitable extinguishing media | : Data not available |
| Specific hazards during fire-fighting | : Sustained fire attack on vessels may result in a Boiling Liquid Expanding Vapor Explosion (BLEVE).
The vapour is heavier than air, spreads along the ground and distant ignition is possible.
Contents are under pressure and can explode when exposed to heat or flames.
As the vapours become lighter than air, the vapours may reach ignition sources at ground or elevated locations. |
| Specific extinguishing methods | : Standard procedure for chemical fires. |
| Further information | : Clear fire area of all non-emergency personnel.
Keep adjacent containers cool by spraying with water. |
| Special protective equipment for firefighters | : Wear full protective clothing and self-contained breathing apparatus.

Proper protective equipment including chemical resistant gloves are to be worn; chemical resistant suit is indicated if large contact with spilled product is expected. Self-Contained Breathing Apparatus must be worn when approaching a fire in a confined space. Select fire fighter's clothing approved to relevant Standards (e.g. Europe: EN469). |

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.
Be ready for fire or possible exposure.
Stay upwind and keep out of low areas.
Avoid contact with skin, eyes and clothing.
Isolate hazard area and deny entry to unnecessary or unprotected personnel.
Do not breathe fumes, vapour.
Do not operate electrical equipment.
- Environmental precautions : Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area and evacuate all personnel. Attempt to disperse the gas or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas meter.
- Methods and materials for containment and cleaning up : Allow to evaporate.
Attempt to disperse the vapour or to direct its flow to a safe location, for example by using fog sprays. Otherwise treat as for small spillage.

Observe all relevant local and international regulations.
- Additional advice : Risk of explosion. Inform the emergency services if liquid enters surface water drains.
Vapour may form an explosive mixture with air.

Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.
U.S. regulations may require reporting releases of this material to the environment which exceed the reportable quantity (refer to Chapter 15) to the National Response Center at (800) 424-8802.

SECTION 7. HANDLING AND STORAGE

- Technical measures : Avoid breathing of or direct contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.
Use the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

-
- Ensure that all local regulations regarding handling and storage facilities are followed.
- Advice on safe handling : Avoid inhaling vapour and/or mists.
Avoid contact with skin, eyes and clothing.
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.
The vapour is heavier than air. Beware of accumulation in pits and confined spaces.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
Bulk storage tanks should be diked (bunded).
Properly dispose of any contaminated rags or cleaning materials in order to prevent fires.
Even with proper grounding and bonding, this material can still accumulate an electrostatic charge.
If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.
Be aware of handling operations that may give rise to additional hazards that result from the accumulation of static charges.
These include but are not limited to pumping (especially turbulent flow), mixing, filtering, splash filling, cleaning and filling of tanks and containers, sampling, switch loading, gauging, vacuum truck operations, and mechanical movements.
These activities may lead to static discharge e.g. spark formation.
Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (≤ 1 m/s until fill pipe submerged to twice its diameter, then ≤ 7 m/s). Avoid splash filling.
Do NOT use compressed air for filling, discharging, or handling operations.
- Avoidance of contact : Strong oxidising agents.
If copper, copper alloys, monel, silver, mercury or magnesium is used during construction or maintenance, the formation of explosive acetylides can occur as a result of contact with butadiene. If Teflon® or Delrin® is used, polymer formation may result.
- Product Transfer : Refer to guidance under Handling section.
- Conditions for safe storage : Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.
- Further information on storage stability : Electrostatic charges will be generated during pumping.
Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk.
The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version 13.0 Revision Date: 06/05/2018 SDS Number: 800001008859 Print Date: 09/03/2022
Date of last issue: 07/25/2016

Keep away from aerosols, flammables, oxidizing agents, corrosives and from other flammable products which are not harmful or toxic to man or to the environment.
Must be stored in a diked (bunded) well-ventilated area, away from sunlight, ignition sources and other sources of heat.
Must be kept inhibited during storage and shipment as material can polymerise.
Vapours from tanks should not be released to atmosphere.
Breathing losses during storage should be controlled by a suitable vapour treatment system.
Storage Temperature:
25 °C / 77 °F maximum.
Nitrogen blanket recommended.
The product is normally supplied in a stabilized form. If the permissible storage period and/or storage temperature is noticeably exceeded, the product may polymerise with heat evolution.
Stable under recommended storage conditions.

Packaging material : Suitable material: For containers, or container linings use mild steel, stainless steel.
Unsuitable material: Copper., Copper alloys., Magnesium., Mercury., Monel., Silver.

Specific use(s) : Not applicable

See additional references that provide safe handling practices for liquids that are determined to be static accumulators:
American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or
National Fire Protection Agency 77 (Recommended Practices on Static Electricity).
IEC/TS 60079-32-1: Electrostatic hazards, guidance

SECTION 8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
isobutane	75-28-5	STEL	1,000 ppm	ACGIH
butane	106-97-8	STEL	1,000 ppm	ACGIH
2-methylpropene	115-11-7	TWA	250 ppm	ACGIH
but-1-ene	106-98-9	TWA	250 ppm	ACGIH
trans-2-Butene	624-64-6	TWA	250 ppm	ACGIH
(Z)-but-2-ene	590-18-1	TWA	250 ppm	ACGIH
1,3-butadiene	106-99-0	TWA	2 ppm	ACGIH
1,3-butadiene		PEL	1 ppm	OSHA CARC

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version 13.0 Revision Date: 06/05/2018 SDS Number: 800001008859 Print Date: 09/03/2022
Date of last issue: 07/25/2016

1,3-butadiene		STEL	5 ppm	OSHA CARC
1,3-butadiene		TWA	1 ppm	OSHA Z-1
1,3-butadiene		STEL	5 ppm	OSHA Z-1

Biological occupational exposure limits

Components	CAS-No.	Control parameters	Biological specimen	Sam-pling time	Permissible concentra-tion	Basis
1,3-butadiene	106-99-0	1,2 Dihydroxy-4-(N-acetylcysteinyl)-butane	Urine	End of shift (As soon as possible after exposure ceases)	2.5 mg/l	ACGIH BEI
		Mixture of N-1 and N-2(hydroxybutenyl)valine	Hemoglobin (Hb) adducts in blood	Not critical	2.5 picomoles per gram Hemoglobin	ACGIH BEI

Monitoring Methods

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate.

Validated exposure measurement methods should be applied by a competent person and samples analysed by an accredited laboratory.

Examples of sources of recommended exposure measurement methods are given below or contact the supplier. Further national methods may be available.

National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods <http://www.cdc.gov/niosh/>

Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods <http://www.osha.gov/>

Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances <http://www.hse.gov.uk/>

Institut für Arbeitsschutz Deutschen Gesetzlichen Unfallversicherung (IFA) , Germany <http://www.dguv.de/inhalt/index.jsp>

L'Institut National de Recherche et de Sécurité, (INRS), France <http://www.inrs.fr/accueil>

Engineering measures : The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include:
Use sealed systems as far as possible.
Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits.
Local exhaust ventilation is recommended.
Firewater monitors and deluge systems are recommended.
Eye washes and showers for emergency use.

General Information:

Consider technical advances and process upgrades (including automation) for the elimination of releases. Minimise ex-

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

posure using measures such as closed systems, dedicated facilities and suitable general/local exhaust ventilation. Drain down systems and clear transfer lines prior to breaking containment. Clean/flush equipment, where possible, prior to maintenance. Where there is potential for exposure: restrict access to authorised persons; provide specific activity training to operators to minimise exposures; wear suitable gloves and coveralls to prevent skin contamination; wear respiratory protection when there is potential for inhalation; clear up spills immediately and dispose of wastes safely. Ensure safe systems of work or equivalent arrangements are in place to manage risks. Regularly inspect, test and maintain all control measures. Consider the need for risk based health surveillance.

Personal protective equipment

Respiratory protection : If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g. airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of mask and filter. If air-filtering respirators are suitable for conditions of use:

Select a filter suitable for organic gases and vapours [Type AX boiling point $\leq 65^{\circ}\text{C}$ (149°F)].

Respirator selection, use and maintenance should be in accordance with the requirements of the OSHA Respiratory Protection Standard, 29 CFR 1910.134.

Hand protection
Remarks

: Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739) made from the following materials may provide suitable chemical protection. When prolonged or frequent repeated contact occurs. Viton. For incidental contact/splash protection - Neoprene rubber. If contact with liquefied product is possible or anticipated, gloves should be thermally insulated to prevent cold burns. For continuous contact we recommend gloves with breakthrough time of more than 240 minutes with preference for > 480 minutes where suitable gloves can be identified. For short-term/splash protection we recommend the same, but recognize that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time maybe acceptable so long as appropriate maintenance and replacement regimes

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Glove thickness should be typically greater than 0.35 mm depending on the glove make and model. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturizer is recommended.

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|--------------------------|---|---|
| Eye protection | : | Wear goggles for use against liquids and gas, combined with face shield with chin guard. |
| Skin and body protection | : | Wear antistatic and flame retardant clothing. Chemical and cryogenic gloves/gauntlets, boots, and apron. |
| Protective measures | : | Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers. |
| Thermal hazards | : | When handling cold material that can cause frost burns, wear heat resistant gloves, safety hat and visor, cold resistant overalls (with cuffs over gloves and legs over boots) and heavy duty boots e.g. leather for cold resistance. |
| Hygiene measures | : | Wash hands before eating, drinking, smoking and using the toilet.
Launder contaminated clothing before re-use. |

Environmental exposure controls

- | | | |
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| General advice | : | Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.
Minimise release to the environment. An environmental assessment must be made to ensure compliance with local environmental legislation.
Information on accidental release measures are to be found in section 6. |
|----------------|---|--|

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- | | | |
|-----------------|---|------------------------------|
| Appearance | : | Clear liquid under pressure. |
| Colour | : | colourless |
| Odour | : | slight |
| Odour Threshold | : | Data not available |
| pH | : | Data not available |

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

Melting point/freezing point	:	Not applicable
Boiling point/boiling range	:	Data not available
Flash point	:	< -93 °C / < -135 °F
Evaporation rate	:	Data not available
Flammability (solid, gas)	:	Not applicable
Flammability (liquids)	:	Static-accumulating flammable liquid.
Upper explosion limit / upper flammability limit	:	Data not available
Lower explosion limit / Lower flammability limit	:	Data not available
Vapour pressure	:	Data not available
Relative vapour density	:	1.9 (Air = 1.0)
Relative density	:	0.6052
Density	:	Data not available
Solubility(ies) Water solubility	:	0.05 g/l negligible
Partition coefficient: n-octanol/water	:	Data not available
Auto-ignition temperature	:	Data not available
Decomposition temperature	:	Data not available
Viscosity Viscosity, dynamic	:	Data not available
Viscosity, kinematic	:	Data not available
Explosive properties	:	Not applicable
Oxidizing properties	:	Data not available
Surface tension	:	Data not available
Conductivity	:	Low conductivity: < 100 pS/m, The conductivity of this material makes it a static accumulator., A liquid is typically considered nonconductive if its conductivity is below 100 pS/m and is

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

Molecular weight	:	considered semi-conductive if its conductivity is below 10,000 pS/m., Whether a liquid is nonconductive or semi-conductive, the precautions are the same., A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid Data not available
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SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Reacts violently with strong oxidising agents.
Chemical stability	:	Oxidises on contact with air to form unstable peroxides. Unstable at elevated temperatures.
Possibility of hazardous reactions	:	Polymerisation may occur at elevated temperatures.
Conditions to avoid	:	Heat, flames, and sparks. Exposure to air.
Incompatible materials	:	Strong oxidising agents. If copper, copper alloys, monel, silver, mercury or magnesium is used during construction or maintenance, the formation of explosive acetylides can occur as a result of contact with butadiene. If Teflon® or Delrin® is used, polymer formation may result.
Hazardous decomposition products	:	Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment	:	Information given is based on product testing, and/or similar products, and/or components.
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Information on likely routes of exposure

Inhalation is the primary route of exposure although exposure may occur through skin or eye contact.

Acute toxicity

Product:

Acute oral toxicity	:	Remarks: Based on available data, the classification criteria are not met.
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SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

Acute inhalation toxicity : Remarks: Low toxicity by inhalation.
High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.

Acute dermal toxicity : Remarks: Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Product:

Remarks: Not irritating to skin.

Serious eye damage/eye irritation

Product:

Remarks: Not irritating to eye.

Respiratory or skin sensitisation

Product:

Remarks: Not a sensitiser.

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

Germ cell mutagenicity

Product:

: Remarks: Contains 1,3-butadiene., May cause heritable genetic damage

Carcinogenicity

Product:

Remarks: Contains 1,3-butadiene., Known human carcinogen.

IARC	Group 1: Carcinogenic to humans	
	1,3-butadiene	106-99-0
OSHA	OSHA specifically regulated carcinogen	
	1,3-butadiene	106-99-0
NTP	Known to be human carcinogen	
	1,3-butadiene	106-99-0

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

Reproductive toxicity

Product:

:

Remarks: Does not impair fertility., Not a developmental toxicant., Based on available data, the classification criteria are not met.

STOT - single exposure

Product:

Remarks: Inhalation of vapours or mists may cause irritation to the respiratory system.

STOT - repeated exposure

Product:

Remarks: Contains 1,3-butadiene., Blood-forming organs: repeated exposure affects the bone marrow., Reproductive system: repeated exposure affects the ovaries and testes in mice.

Aspiration toxicity

Product:

Not an aspiration hazard.

Further information

Product:

Remarks: Rapid release of gases which are liquids under pressure may cause frost burns of exposed tissues (skin, eye) due to evaporative cooling., Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest.

SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Incomplete ecotoxicological data are available for this product. The information given below is based partly on a knowledge of the components and the ecotoxicology of similar products.

Ecotoxicity

no data available

Persistence and degradability

Product:

Biodegradability : Remarks: Oxidises rapidly by photo-chemical reactions in air. Not readily biodegradable.

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

Mobility in soil

Product:

Mobility : Remarks: Because of their extreme volatility, air is the only environmental compartment that hydrocarbon gases will be found.

Other adverse effects

Product:

Additional ecological information : Physical properties indicate that hydrocarbon gases will rapidly volatilise from the aquatic environment and that acute and chronic effects would not be observed in practice.

In view of the high rate of loss from solution, the product is unlikely to pose a significant hazard to aquatic life.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : Recover or recycle if possible.
It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.

Do not dispose into the environment, in drains or in water courses

Waste product should not be allowed to contaminate soil or water.

Disposal should be in accordance with applicable regional, national, and local laws and regulations.
Local regulations may be more stringent than regional or national requirements and must be complied with.

Contaminated packaging : Drain container thoroughly.
After draining, vent in a safe place away from sparks and fire.
Residues may cause an explosion hazard.
Do not puncture, cut, or weld uncleaned drums.
Send to drum recoverer or metal reclaimer.

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR
1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

SECTION 14. TRANSPORT INFORMATION

National Regulations

US Department of Transportation Classification (49 CFR Parts 171-180)

UN/ID/NA number	: UN 1075
Proper shipping name	: PETROLEUM GASES, LIQUEFIED
Class	: 2.1
Packing group	: Not Assigned
Labels	: 2.1
Reportable quantity	Isobutane (100 lb) Butane (100 lb)
ERG Code	: 115
Marine pollutant	: no
Remarks	: NOT-ODORIZED

International Regulations

IATA-DGR

UN/ID No.	: UN 1075
Proper shipping name	: PETROLEUM GASES, LIQUEFIED
Class	: 2.1
Packing group	: Not Assigned
Labels	: 2.1

IMDG-Code

UN number	: UN 1075
Proper shipping name	: PETROLEUM GASES, LIQUEFIED
Class	: 2.1
Packing group	: Not Assigned
Labels	: 2.1
Marine pollutant	: no

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

Not applicable for product as supplied. MARPOL Annex 1 rules apply for bulk shipments by sea.

Special precautions for user

Remarks	: Special Precautions: Refer to Chapter 7, Handling & Storage, for special precautions which a user needs to be aware of or needs to comply with in connection with transport.
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SECTION 15. REGULATORY INFORMATION

EPCRA - Emergency Planning and Community Right-to-Know Act

CERCLA Reportable Quantity

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version 13.0 Revision Date: 06/05/2018 SDS Number: 800001008859 Print Date: 09/03/2022
Date of last issue: 07/25/2016

Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
isobutane	75-28-5	100	238

*: The components with RQs are given for information.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards : Flammable (gases, aerosols, liquids, or solids)
Gases under pressure
Germ cell mutagenicity
Carcinogenicity

SARA 313 : The following components are subject to reporting levels established by SARA Title III, Section 313:

1,3-butadiene 106-99-0 >= 0.1 - < 1 %

Clean Water Act

This product does not contain any Hazardous Chemicals listed under the U.S. CleanWater Act, Section 311, Table 117.3.

US State Regulations

Pennsylvania Right To Know

isobutane	75-28-5
2-methylpropene	115-11-7
butane	106-97-8
but-1-ene	106-98-9
trans-2-Butene	624-64-6
(Z)-but-2-ene	590-18-1
1,3-butadiene	106-99-0

California Prop. 65

WARNING: This product can expose you to chemicals including 1,3-butadiene, which is/are known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

California List of Hazardous Substances

butane 106-97-8

California Regulated Carcinogens

1,3-butadiene 106-99-0

Other regulations:

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

The components of this product are reported in the following inventories:

AIIC : Listed

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

DSL	: Listed
EINECS	: Listed
KECI	: Listed
TSCA	: Listed

SECTION 16. OTHER INFORMATION

Further information

NFPA Rating (Health, Fire, Reactivity) 2, 4, 0

Full text of other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI	: ACGIH - Biological Exposure Indices (BEI)
OSHA CARC	: OSHA Specifically Regulated Chemicals/Carcinogens
OSHA Z-1	: USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
ACGIH / TWA	: 8-hour, time-weighted average
ACGIH / STEL	: Short-term exposure limit
OSHA CARC / PEL	: Permissible exposure limit (PEL)
OSHA CARC / STEL	: Excursion limit
OSHA Z-1 / TWA	: 8-hour time weighted average
OSHA Z-1 / STEL	: Short Term Exposure Limit
Abbreviations and Acronyms	: The standard abbreviations and acronyms used in this document can be looked up in reference literature (e.g. scientific dictionaries) and/or websites.

ACGIH = American Conference of Governmental Industrial Hygienists
ADR = European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS = Australian Inventory of Chemical Substances
ASTM = American Society for Testing and Materials
BEL = Biological exposure limits
BTEX = Benzene, Toluene, Ethylbenzene, Xylenes
CAS = Chemical Abstracts Service
CEFIC = European Chemical Industry Council
CLP = Classification Packaging and Labelling
COC = Cleveland Open-Cup
DIN = Deutsches Institut für Normung
DMEL = Derived Minimal Effect Level
DNEL = Derived No Effect Level
DSL = Canada Domestic Substance List
EC = European Commission
EC50 = Effective Concentration fifty
ECETOC = European Center on Ecotoxicology and Toxicology

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR
1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

gy Of Chemicals
ECHA = European Chemicals Agency
EINECS = The European Inventory of Existing Commercial
Chemical Substances
EL50 = Effective Loading fifty
ENCS = Japanese Existing and New Chemical Substances
Inventory
EWC = European Waste Code
GHS = Globally Harmonised System of Classification and
Labelling of Chemicals
IARC = International Agency for Research on Cancer
IATA = International Air Transport Association
IC50 = Inhibitory Concentration fifty
IL50 = Inhibitory Level fifty
IMDG = International Maritime Dangerous Goods
INV = Chinese Chemicals Inventory
IP346 = Institute of Petroleum test method N° 346 for the
determination of polycyclic aromatics DMSO-extractables
KECI = Korea Existing Chemicals Inventory
LC50 = Lethal Concentration fifty
LD50 = Lethal Dose fifty per cent.
LL/EL/IL = Lethal Loading/Effective Loading/Inhibitory loading
LL50 = Lethal Loading fifty
MARPOL = International Convention for the Prevention of
Pollution From Ships
NOEC/NOEL = No Observed Effect Concentration / No Ob-
served Effect Level
OE_HPV = Occupational Exposure - High Production Volume
PBT = Persistent, Bioaccumulative and Toxic
PICCS = Philippine Inventory of Chemicals and Chemical
Substances
PNEC = Predicted No Effect Concentration
REACH = Registration Evaluation And Authorisation Of
Chemicals
RID = Regulations Relating to International Carriage of Dan-
gerous Goods by Rail
SKIN_DES = Skin Designation
STEL = Short term exposure limit
TRA = Targeted Risk Assessment
TSCA = US Toxic Substances Control Act
TWA = Time-Weighted Average
vPvB = very Persistent and very Bioaccumulative

A vertical bar (|) in the left margin indicates an amendment from the previous version.

|| Due to a change in detail in Section 15, this document has been released as a significant change.

Sources of key data used to compile the Safety Data Sheet : The quoted data are from, but not limited to, one or more sources of information (e.g. toxicological data from Shell Health Services, material suppliers' data, CONCAWE, EU IUCLID date base, EC 1272 regulation, etc).

SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR
1910.1200

BD3 Butylenes

Version	Revision Date:	SDS Number:	Print Date: 09/03/2022
13.0	06/05/2018	800001008859	Date of last issue: 07/25/2016

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The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

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