

# SAFETY DATA SHEET

According to OSHA Hazard Communication Standard, 29 CFR 1910.1200

## OP-2 MIXED C4S

Version	Revision Date:	SDS Number:	Print Date: 01/03/2020
1.0	01/03/2020	800010038103	Date of last issue: 01/03/2020

### SECTION 1. IDENTIFICATION

Product name : OP-2 MIXED C4S

Product code : X2108

#### Manufacturer or supplier's details

Manufacturer/Supplier : **Deer Park Refining**  
PO Box 4453  
HOUSTON TX 77210-4453  
USA

SDS Request : (+1) 877-276-7285  
Customer Service :

#### Emergency telephone number

Spill Information : +1-877-504-9351  
Health Information : +1-877-242-7400

#### Recommended use of the chemical and restrictions on use

Recommended use : Intermediate Refinery Stream.  
Restrictions on use : This product must not be used in applications other than those listed in Section 1 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 : Compressed gas  
Carcinogenicity : Category 1A  
Germ cell mutagenicity : Category 1B

#### GHS label elements

Hazard pictograms :



Signal word : Danger

Hazard statements : PHYSICAL HAZARDS:

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

### Precautionary statements

**Prevention:**  
P201 + P202 Obtain special instructions before use. 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.  
P281 Use personal protective equipment as required.

**Response:**  
P308 + P313 IF exposed or concerned: Get medical advice/ attention.  
P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P381 Eliminate all ignition sources if safe to do so.

**Storage:**  
P410 + 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

High gas concentrations will displace available air; unconsciousness and death may occur suddenly from lack of oxygen.  
Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger.  
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)
Butene	butene	25167-67-3	40 - 50
isobutane	isobutane (Gas)	75-28-5	25 - 30

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butane	butane (Gas)	106-97-8	5 - 20
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### SECTION 4. FIRST-AID MEASURES

- |  |   |
|--|---|
| If inhaled   | : 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  | : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.<br>If persistent irritation occurs, obtain medical attention.   |
| In case of eye contact   | : Flush eye with copious quantities of water.<br>Remove contact lenses, if present and easy to do. Continue rinsing.<br>If persistent irritation occurs, obtain medical attention.  |
| If swallowed   | : In general no treatment is necessary unless large quantities are swallowed, however, get medical advice.  |
| Most important symptoms and effects, both acute and delayed                | : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or 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 | : Treat symptomatically.<br>Administer oxygen if necessary.   |

Potential for cardiac sensitisation, particularly in abuse situations. Hypoxia or negative inotropes may enhance these effects. Consider: oxygen therapy.

### SECTION 5. FIRE-FIGHTING MEASURES

- |                                       |   |
|---------------------------------------|---|
| Suitable extinguishing media          | : Shut off supply. If not possible and no risk to surroundings, let the fire burn itself out.<br>Use foam, water fog for major fires.<br>Use dry chemical powder, carbon dioxide, sand or earth for minor fires.  |
| Unsuitable extinguishing media        | : Do not use direct water jets on the burning product as they could cause a steam explosion and spread of the fire.<br>Simultaneous use of foam and water on the same surface is to be avoided as water destroys the foam.  |
| Specific hazards during fire-fighting | : Hazardous combustion products may include:<br>Carbon monoxide may be evolved if incomplete combustion occurs.<br>Unidentified organic and inorganic compounds.<br>Sustained fire attack on vessels may result in a Boiling Liquid Expanding Vapor Explosion (BLEVE).<br>Contents are under pressure and can explode when exposed to heat or flames.<br>The vapour is heavier than air, spreads along the ground and |

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distant ignition is possible.

- |   |   |  |
|---|---|--|
| Specific extinguishing methods                | : | Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  |
| Further information                           | : | Clear fire area of all non-emergency personnel.<br>Keep adjacent containers cool by spraying with water.<br>If possible remove containers from the danger zone.<br>If the fire cannot be extinguished the only course of action is to evacuate immediately.  |
| Special protective equipment for firefighters | : | 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). |

### SECTION 6. ACCIDENTAL RELEASE MEASURES

- |   |   |  |
|---|---|--|
| Personal precautions, protective equipment and emergency procedures | : | 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. Test atmosphere for flammable gas concentrations to ensure safe working conditions before personnel are allowed to enter the area.  |
| Environmental precautions   | : | Use appropriate containment to avoid environmental contamination.  |
| Methods and materials for containment and cleaning up               | : | Allow to evaporate.<br>Attempt to disperse the gas or to direct its flow to a safe location, for example by using fog sprays.<br>Take precautionary measures against static discharges.<br><br>Avoid contact with skin, eyes and clothing.<br>Evacuate the area of all non-essential personnel.<br>Ventilate contaminated area thoroughly.<br>If contamination of site occurs remediation may require specialist advice.<br>Take precautionary measures against static discharges.<br>Ensure electrical continuity by bonding and grounding (earthing) all equipment.<br>Observe all relevant local and international regulations. |
| Additional advice   | : | For guidance on selection of personal protective equipment see Chapter 8 of this Safety Data Sheet.<br>Notify authorities if any exposure to the general public or the environment occurs or is likely to occur.<br>For guidance on disposal of spilled material see Chapter 13 of this Safety Data Sheet.   |

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Vapour may form an explosive mixture with air.  
Risk of explosion. Inform the emergency services if product enters surface water drains.

### SECTION 7. HANDLING AND STORAGE

- |  |  |
|--|--|
| Technical measures                       | :<br>: 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.<br>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.<br>Air-dry contaminated clothing in a well-ventilated area before laundering.<br>Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.<br>Take precautionary measures against static discharges. |
| Advice on safe handling                  | :<br>: Ensure that all local regulations regarding handling and storage facilities are followed.<br>This product is intended for use in closed systems only.<br>This product can create a low temperature exposure hazard when released as a liquid.<br>Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.<br>Avoid prolonged or repeated contact with skin.<br>Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.<br>Earth all equipment.<br>Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.   |
| Avoidance of contact<br>Product Transfer | :<br>: Strong oxidising agents.<br>: Refer to guidance under Handling section. Do not use compressed air for filling discharge or handling. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping in order to avoid generation of electrostatic discharge. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. Delivery lines may become cold enough to present a cold burns hazard.  |
| Further information on storage stability | :<br>: The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable.<br>Store only in purpose-designed, appropriately labelled pressure vessels or cylinders.<br>Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat.<br>Do not store near cylinders containing compressed oxygen or other strong oxidizers.<br>Refer to section 15 for any additional specific legislation covering the packaging and storage of this product.  |

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- Packaging material : Suitable material: For containers and container linings, use materials specifically approved for use with this product., Examples of suitable materials are: PA-11, PEEK, PVDF, PTFE, GRE (Epoxy), GRVE (vinyl ester), Viton (FKM), type F and GB, Neoprene (CR).  
Unsuitable material: Some forms of cast iron., Examples of materials to avoid are: ABS, polymethyl methacrylate (PMMA), polyethylene (PE / HDPE), polypropylene (PP), PVC, natural rubber (NR), Nitrile (NBR) ethylene propylene rubber (EPDM), Butyl (IIR), Hypalon (CSM), polystyrene, polyvinyl chloride (PVC), polyisobutylene., For containers and container linings, aluminium should not be used if there is a risk of caustic contamination of the product.
- Container Advice : Do not cut, drill, grind, weld or perform similar operations on or near containers. Containers, even those that have been emptied, can contain explosive vapours.
- 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
Butene	25167-67-3	TWA	250 ppm	ACGIH
isobutane	75-28-5	STEL	1,000 ppm	ACGIH
butane	106-97-8	STEL	1,000 ppm	ACGIH
1,3-butadiene	106-99-0	TWA	2 ppm	ACGIH
1,3-butadiene		PEL	1 ppm	OSHA CARC
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	Sampling time	Permissible concentration	Basis
1,3-butadiene	106-99-0	1,2 Dihydroxy-4-(N-acetylcyste-	Urine	End of shift (As soon as	2.5 mg/l	ACGIH BEI

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		inyl)-butane		possible after exposure ceases)		
		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.  
Eye washes and showers for emergency use.

#### General Information:

Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping.

Define procedures for safe handling and maintenance of controls.

Educate and train workers in the hazards and control measures relevant to normal activities associated with this product.

Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation.

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Drain down system prior to equipment break-in or maintenance.

Retain drain downs in sealed storage pending disposal or subsequent recycle.

Do not ingest. If swallowed then seek immediate medical assistance

### 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. All respiratory protection equipment and use must be in accordance with local regulations. 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

: 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. 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. 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. 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. Neoprene rubber. Nitrile 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 are followed.

Eye protection : Wear safety glasses and face shield (preferably with a chin guard) if splashes are likely to occur.

Skin and body protection : Chemical and cold resistant gloves/gauntlets, boots, and apron.



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Protective measures : Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

### Environmental exposure controls

General advice : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid under pressure.  
Colour : colourless  
Odour : Unstented, odourless  
Odour Threshold : Data not available

pH : Not applicable

Initial boiling point and boiling range : ca. -12 - 0 °C / 10 - 32 °F

Flash point : < -50 °C / < -58 °F

Evaporation rate : Data not available

Flammability (solid, gas) : Extremely flammable.

Upper explosion limit / upper flammability limit : Typical 10 %(V)

Vapour pressure : 350 - 500 kPa (38.0 °C / 100.4 °F)

Method: Unspecified

Relative vapour density : Data not available

Relative density : Data not available

Density : 590 kg/m<sup>3</sup> (15.0 °C / 59.0 °F)  
Method: Unspecified

### Solubility(ies)

Water solubility : negligible

Solubility in other solvents : Data not available

Partition coefficient: n-octanol/water : log Pow: < 4

Auto-ignition temperature : > 350 °C / > 662 °F

Decomposition temperature : Data not available

### Viscosity

Viscosity, kinematic : Data not available

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Explosive properties : Classification Code: Not classified

### SECTION 10. STABILITY AND REACTIVITY

Reactivity	: No, product will not become self-reactive.
Chemical stability	: Stable under normal conditions of use.
Possibility of hazardous reactions	: No. Hazardous, exothermic polymerization cannot occur.
Conditions to avoid	: Heat, open flames, sparks and flammable atmospheres. In certain circumstances product can ignite due to static electricity.
Incompatible materials	: Strong oxidising agents.
Hazardous decomposition products	: Hazardous decomposition products are not expected to form during normal storage.

### SECTION 11. TOXICOLOGICAL INFORMATION

Basis for assessment : Information given is based on product data, a knowledge of the components and the toxicology of similar products.  
Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).

#### 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: Not applicable

Acute inhalation toxicity : LC 50 (Rat): > 20 mg/l  
Exposure time: 4 h  
Remarks: Low toxicity:

Acute dermal toxicity : Remarks: Not applicable

#### Skin corrosion/irritation

##### Product:

Remarks: Not irritating to skin.

#### Serious eye damage/eye irritation

##### Product:

Remarks: Essentially non-irritating to eyes.

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### Respiratory or skin sensitisation

#### Product:

Remarks: Not a sensitiser.

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

### Germ cell mutagenicity

#### Product:

: Remarks: May cause heritable genetic damage, Mutagen  
classification based on Butadiene content at  $\geq 0.1\%$ .

### Carcinogenicity

#### Product:

Remarks: Causes cancer in laboratory animals., Carcinogen classification based on Butadiene  
content at  $\geq 0.1\%$ .

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

### Reproductive toxicity

#### Product:

:  
Remarks: Not a developmental toxicant., Does not impair  
fertility., 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: Low systemic toxicity on repeated exposure.

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### 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., High gas concentrations will displace available air; unconsciousness and death may occur suddenly from lack of oxygen., Exposure to very high concentrations of similar materials has been associated with irregular heart rhythms and cardiac arrest.

Remarks: Classifications by other authorities under varying regulatory frameworks may exist.

## SECTION 12. ECOLOGICAL INFORMATION

Basis for assessment : Information given is based on product testing, and/or similar products, and/or components.  
Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).  
Physical properties indicate that petroleum gases will rapidly volatilise from the aquatic environment and that acute and chronic effects would not be observed in practice.

### Ecotoxicity

#### Product:

Toxicity to fish (Acute toxicity)	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to daphnia and other aquatic invertebrates (Acute toxicity)	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to algae (Acute toxicity)	:	Remarks: Practically non toxic: LL/EL/IL50 > 100 mg/l
Toxicity to fish (Chronic toxicity)	:	Remarks: Data not available
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	Remarks: Data not available
Toxicity to microorganisms (Acute toxicity)	:	Remarks: LL/EL/IL50 > 100 mg/l Practically non toxic: Based on available data, the classification criteria are not met.

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### Persistence and degradability

#### Product:

Biodegradability : Remarks: Oxidises rapidly by photo-chemical reactions in air. Readily biodegradable.

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

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## SECTION 13. DISPOSAL CONSIDERATIONS

### Disposal methods

Waste from residues : 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. Waste arising from a spillage or tank cleaning should be disposed of in accordance with prevailing regulations, preferably to a recognised collector or contractor. The competence of the collector or contractor should be established beforehand. Do not dispose into the environment, in drains or in water courses. Given the nature and uses of this product, the need for disposal seldom arises. If necessary, dispose by controlled combustion in purpose-designed equipment. If this is not possible, contact the supplier.

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 pollute the soil, water or environment with the waste container. Return part-used or empty cylinders to the supplier. For tanks seek specialist advice from suppliers. Dispose in accordance with prevailing regulations, preferably to a recognized collector or contractor. The competence of

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<b>Local legislation</b>	the collector or contractor should be established beforehand.
Remarks	: 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.

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### SECTION 14. TRANSPORT INFORMATION

#### National Regulations

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

UN/ID/NA number	: UN 1965
Proper shipping name	: HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.
Class	: 2.1
Packing group	: Not Assigned
Labels	: 2.1
Marine pollutant	: no

#### International Regulations

##### IATA-DGR

UN/ID No.	: UN 1965
Proper shipping name	: HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.
Class	: 2.1
Packing group	: Not Assigned
Labels	: 2.1

##### IMDG-Code

UN number	: UN 1965
Proper shipping name	: HYDROCARBON GAS MIXTURE, LIQUEFIED, N.O.S.
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**

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Components	CAS-No.	Component RQ (lbs)	Calculated product RQ (lbs)
1,3-butadiene	106-99-0	10	10

\*: The components with RQs are given for information., Shell classifies this material as an "oil" under the CERCLA Petroleum Exclusion, therefore releases to the environment are not reportable under CERCLA.

### 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  
Carcinogenicity  
Germ cell mutagenicity

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

1,3-butadiene	106-99-0	>= 90 - <= 100 %
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### 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

1,3-butadiene	106-99-0
Butene	25167-67-3
isobutane	75-28-5
butane	106-97-8

#### 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](http://www.P65Warnings.ca.gov).

#### California List of Hazardous Substances

1,3-butadiene	106-99-0
butane	106-97-8

#### California Regulated Carcinogens

1,3-butadiene	106-99-0
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#### 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:

EINECS/ELINCS/EC : All components listed.

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DSL	:	All components listed.
TSCA	:	All components listed.
AIIC	:	All components listed.
PICCS	:	All components listed.

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### SECTION 16. OTHER INFORMATION

#### Further information

NFPA Rating (Health, Fire, Reactivity) 1, 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 Of Chemicals



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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 Observed Effect Level  
OE\_HP V = 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 Dangerous 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

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

Revision Date : 06/19/2018

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

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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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