

SAFETY DATA SHEET

according to the Hazardous Products Regulations

NGL - Mixed Butane Plus – NonOdorized

Version	Revision Date:	SDS Number:	Print Date: 2025-05-15
3.1	2025-05-08	800010025846	Date of last issue: 26.09.2024
			Date of first issue: 19.11.2015

SECTION 1. IDENTIFICATION

Product name : NGL - Mixed Butane Plus – NonOdorized

Product code : X3546

Manufacturer or supplier's details

Manufacturer/Supplier : **Shell Chemicals Canada**
PO Box 4280 STN C
CALGARY AB T2T 5Z5
Canada

Telephone : 1-855-697-4355

Telefax : 1-866-213-7508

Emergency telephone number

CHEMTREC (24 hr) : 1-800-424-9300

Recommended use of the chemical and restrictions on use

Recommended use : Chemical intermediate.

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 the Hazardous Products Regulations

Flammable gases : Category 1A

Gases under pressure : Liquefied gas

GHS label elements

Hazard pictograms : 

Signal word : Danger

Hazard statements : PHYSICAL HAZARDS:
H220 Extremely flammable gas.
H280 Contains gas under pressure; may explode if heated.
HEALTH HAZARDS:

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Not classified as a health hazard under GHS criteria.
ENVIRONMENTAL HAZARDS:
Not classified as an environmental hazard under GHS criteria.

Precautionary statements : P102 Keep out of reach of children.

Prevention:

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Response:

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 In case of leakage, eliminate all ignition sources.

Storage:

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Disposal:

No precautionary phrases.

Other hazards which do not result in classification

Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger.

High gas concentrations will displace available air; unconsciousness and death may occur suddenly from lack of oxygen.

Exposure to rapidly expanding gases may cause frost burns to eyes and/or skin.

If sufficient charge is allowed to accumulate, electrostatic discharge and ignition of flammable air-vapour mixtures can occur.

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.

Has the potential to contribute to Global Warming.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Components

Chemical name	Common Name/Synonym	CAS-No.	Concentration (% w/w)
propane	propane (Refrigerated liquid)	74-98-6	5 - 50
butane	butane	106-97-8	20 - 30
isobutane	isobutane (Gas)	75-28-5	15 - 25
pentane	pentane	109-66-0	5 - 20
ethane	ethane (Refrigerated liquid)	74-84-0	1 - 2

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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 | : Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.
If persistent irritation occurs, obtain medical attention.
In the event of frostbite, slowly warm the exposed area by rinsing with warm water.
Transport to the nearest medical facility for additional treatment. |
| In case of eye contact | : Flush eye with copious quantities of water.
Remove contact lenses, if present and easy to do. Continue rinsing.
If persistent irritation occurs, obtain medical attention.
In the event of frostbite, slowly warm the exposed area by rinsing with warm water.
Transport to the nearest medical facility for additional treatment. |
| If swallowed | : In the unlikely event of ingestion, obtain medical attention immediately. |
| Most important symptoms and effects, both acute and delayed | : High gas concentrations will displace available air; unconsciousness and death may occur suddenly from lack of oxygen.
Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache and nausea.
Rapid release of gases which are liquids under pressure may cause frost burns of exposed tissues (skin, eye) due to evaporative cooling. |
| 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. |
| Notes to physician | : IMMEDIATE TREATMENT IS EXTREMELY IMPORTANT!
Potential for cardiac sensitisation, particularly in abuse situations. Hypoxia or negative inotropes may enhance these effects. Consider: oxygen therapy.
Artificial respiration and/or oxygen may be necessary.
Call a doctor or poison control center for guidance.
Treat symptomatically. |

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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.
Dry chemical
Carbon dioxide (CO₂)
Keep containers and surroundings cool with water spray.
Large fires should only be fought by properly trained fire fighters.
- 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.
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:
Carbon monoxide may be evolved if incomplete combustion occurs.
Unidentified organic and inorganic compounds.
Contents are under pressure and can explode when exposed to heat or flames.
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.
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- 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).
- Further information : Clear fire area of all non-emergency personnel.
Keep adjacent containers cool by spraying with water.
If possible remove containers from the danger zone.
If the fire cannot be extinguished the only course of action is to evacuate immediately.

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.
Vapour may form an explosive mixture with air.

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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 prevent uncontrolled release. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Risk of explosion. Inform the emergency services if product enters surface water drains. Avoid contact with skin, eyes and clothing. Evacuate the area of all non-essential personnel. Ventilate contaminated area thoroughly. If contamination of site occurs remediation may require specialist advice. Take precautionary measures against static discharges. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

Observe all relevant local and international regulations.

Methods and materials for containment and cleaning up : Allow to evaporate. Attempt to disperse the gas or to direct its flow to a safe location, for example by using fog sprays. Avoid contact with skin, eyes and clothing. Evacuate the area of all non-essential personnel. Ventilate contaminated area thoroughly. If contamination of site occurs remediation may require specialist advice. Take precautionary measures against static discharges. Ensure electrical continuity by bonding and grounding (earthing) all equipment.

Observe all relevant local and international regulations.

Additional advice : For guidance on selection of personal protective equipment see Section 8 of this Safety Data Sheet. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. For guidance on disposal of spilled material see Section 13 of this Safety Data Sheet. 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

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| 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 Section 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.
Air-dry contaminated clothing in a well-ventilated area before laundering.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols.
Take precautionary measures against static discharges. |
| Advice on safe handling | : Ensure that all local regulations regarding handling and storage facilities are followed.
This product is intended for use in closed systems only.
Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks.
Avoid prolonged or repeated contact with skin.
Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.
Earth all equipment.
Use local exhaust ventilation if there is risk of inhalation of vapours, mists or aerosols. |
| Avoidance of contact | : Strong oxidising agents. |
| Product Transfer | : 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.
Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire. |
| Further information on storage stability | : Store only in purpose-designed, appropriately labelled pressure vessels or cylinders.
Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat.
Do not store near cylinders containing compressed oxygen or other strong oxidizers.
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.

Specific end use(s)

Specific use(s) : 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/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
butane	106-97-8	STEL	1,000 ppm	ACGIH
isobutane	75-28-5	TWA	1,000 ppm	CA BC OEL
		STEL	1,000 ppm	ACGIH
pentane	109-66-0	TWA	1,000 ppm	CA BC OEL
		TWA	1,000 ppm	ACGIH

Biological occupational exposure limits

No biological limit allocated.

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/>

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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.
Drain down system prior to equipment break-in or maintenance.
Retain drain downs in sealed storage pending disposal or subsequent recycle.

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.

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

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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. Neoprene rubber. Nitrile rubber. 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. 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.

Eye protection : Wear goggles for use against liquids and gas, combined with face shield with chin guard.

Skin and body protection : Chemical and cold resistant gloves/gauntlets, boots, and apron. Wear antistatic and flame-retardant clothing. Wear appropriate anti-static safety footwear.

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. 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.

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SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state : compressed liquefied gas

Colour : colourless

Odour : odourless

Odour Threshold : Data not available

Melting point/freezing point : Data not available

Boiling point/boiling range : -70 - 250 °C

Flammability (solid, gas) : Extremely flammable.

Upper explosion limit / Upper flammability limit : 9.5 %(V)

Flash point : -68 °C

Auto-ignition temperature : not determined

Decomposition temperature : Data not available

pH : Not applicable

Viscosity
Viscosity, dynamic : Data not available

Viscosity, kinematic : Data not available

Solubility(ies)
Water solubility : negligible

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Partition coefficient: n-octanol/water : Data not available

Vapour pressure : > 150 kPa (20 °C)

Relative density : 0.5 - 0.68 (15 °C)
Method: ASTM D4052

Density : Data not available

Relative vapour density : 1.6 (101 kPa)
(Air = 1.0)

Particle characteristics
Particle size : Data not available

9.2 Other information

Oxidizing properties : Not applicable

Evaporation rate : not determined

Conductivity : This material is not expected to be a static accumulator.

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 considered semi-conductive if its conductivity is below 10,000 pS/m., Whether a liquid is nonconductive or semiconductive, 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

Surface tension : Data not available

Molecular weight : Data not available

SECTION 10. STABILITY AND REACTIVITY

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Reactivity	:	No, product will not become self-reactive.
Chemical stability	:	Stable under normal conditions of use.
Possibility of hazardous reactions	:	No. Hazardous, exothermical 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 testing. Unless indicated otherwise, the data presented is representative of the product as a whole, rather than for individual component(s).
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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: Not applicable
Acute inhalation toxicity	:	LC 50 (Rat): > 20000 ppmV Exposure time: 4 h Remarks: Low toxicity by inhalation. Based on available data, the classification criteria are not met.
Acute dermal toxicity	:	Remarks: Not applicable

Components:

isobutane:

Acute oral toxicity	:	Remarks: Not applicable
Acute inhalation toxicity	:	LC 50 (Rat): > 20000 ppmV Exposure time: 4 h Remarks: Low toxicity by inhalation. Based on available data, the classification criteria are not met.

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Acute dermal toxicity : Remarks: Not applicable

pentane:

Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 401
Remarks: Based on available data, the classification criteria are not met.

Acute inhalation toxicity : LC50 (Rat, male and female): > 20 mg/l
Exposure time: 4 h
Test atmosphere: vapour
Method: OECD Test Guideline 403
Remarks: Based on available data, the classification criteria are not met.

Skin corrosion/irritation

Product:

Remarks : Not irritating to skin.
Based on available data, the classification criteria are not met.

Components:

isobutane:

Remarks : Not irritating to skin.
Based on available data, the classification criteria are not met.

pentane:

Species : Rabbit
Method : Test(s) equivalent or similar to OECD Test Guideline 404
Remarks : Slightly irritating to skin.
Insufficient to classify.

Serious eye damage/eye irritation

Product:

Remarks : Not irritating to eye.
Based on available data, the classification criteria are not met.

Components:

isobutane:

Remarks : Not irritating to eye.
Based on available data, the classification criteria are not met.

pentane:

Species : Rabbit
Method : OECD Test Guideline 405

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Remarks : Slightly irritating.
Insufficient to classify.

Respiratory or skin sensitisation

Product:

Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

Components:

isobutane:

Remarks : Not a sensitiser.
Based on available data, the classification criteria are not met.

pentane:

Species : Guinea pig
Method : OECD Test Guideline 406
Remarks : Based on available data, the classification criteria are not met.

Germ cell mutagenicity

Product:

Genotoxicity in vivo : Remarks: Non mutagenic
Based on available data, the classification criteria are not met.

Components:

isobutane:

Genotoxicity in vivo : Remarks: Non mutagenic
Based on available data, the classification criteria are not met.

pentane:

Genotoxicity in vitro : Method: Test(s) equivalent or similar to OECD Guideline 471
Remarks: Based on available data, the classification criteria are not met.

Method: Directive 67/548/EEC, Annex V, B.10.
Remarks: Based on available data, the classification criteria are not met.

Genotoxicity in vivo : Species: Rat
Method: Directive 67/548/EEC, Annex V, B.12.
Remarks: Based on available data, the classification criteria are not met.

Carcinogenicity

Product:

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Remarks : Not a carcinogen.
Based on available data, the classification criteria are not met.

Components:

isobutane:

Remarks : Not a carcinogen.
Based on available data, the classification criteria are not met.

IARC No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

OSHA No component of this product present at levels greater than or equal to 0.1% is on OSHA's list of regulated carcinogens.

NTP No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

Reproductive toxicity

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

STOT - single exposure

Product:

Remarks : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.

Components:

isobutane:

Remarks : High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.

pentane:

Exposure routes : Inhalation
Target Organs : Central nervous system
Remarks : May cause drowsiness or dizziness.

STOT - repeated exposure

Product:

Remarks : Low systemic toxicity on repeated exposure.
Based on available data, the classification criteria are not met.

Components:

isobutane:

Remarks : Low systemic toxicity on repeated exposure.

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

pentane:

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

Repeated dose toxicity

Components:

pentane:

Species	: Rat, male and female
Application Route	: Inhalation
Test atmosphere	: Gas
Method	: OECD Test Guideline 413
Target Organs	: No specific target organs noted

Aspiration toxicity

Product:

Not an aspiration hazard.

Components:

isobutane:

Not an aspiration hazard.

pentane:

Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.

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.

Components:

isobutane:

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

pentane:

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

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.
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 : Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates : Remarks: Data not available

Toxicity to algae/aquatic plants : Remarks: Data not available

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 : Remarks: Data not available

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Components:

isobutane:

Toxicity to fish : Remarks: Data not available

Toxicity to daphnia and other aquatic invertebrates : Remarks: Data not available

Toxicity to algae/aquatic plants : Remarks: Data not available

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 : Remarks: Data not available

pentane:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 4.26 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203
Remarks: Toxic
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2.7 mg/l
Exposure time: 48 h
Method: Test(s) equivalent or similar to OECD Guideline 202
Remarks: Toxic
LL/EL/IL50 > 1 <= 10 mg/l

Toxicity to algae/aquatic plants : EC50 (Scenedesmus capricornutum (fresh water algae)): 10.7 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201
Remarks: Harmful
LL/EL/IL50 >10 <= 100 mg/l

Toxicity to fish (Chronic toxicity) : NOELR (Oncorhynchus mykiss (rainbow trout)): 6.165 mg/l
Exposure time: 28 d
Method: Based on quantitative structure-activity relationship (QSAR) modelling
Remarks: NOEC/NOEL > 1.0 - <= 10 mg/l

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOELR (Daphnia magna (Water flea)): 10.76 mg/l
Exposure time: 21 d
Method: Based on quantitative structure-activity relationship (QSAR) modelling
Remarks: No data available

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Toxicity to microorganisms : NOEL (Tetrahymena pyriformis): 23.7 mg/l
Exposure time: 48 h
Method: Based on quantitative structure-activity relationship (QSAR) modelling
Remarks: NOEC/NOEL >100 mg/l

Persistence and degradability

Product:

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

Components:

isobutane:

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

pentane:

Biodegradability : Biodegradation: 87 %
Exposure time: 28 d
Method: Test(s) equivalent or similar to OECD Guideline 301 F
Remarks: Readily biodegradable.
Oxidises rapidly by photo-chemical reactions in air.

Bioaccumulative potential

Product:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

Components:

isobutane:

Bioaccumulation : Remarks: Does not bioaccumulate significantly.

pentane:

Bioaccumulation : Species: Pimephales promelas (fathead minnow)
Bioconcentration factor (BCF): 171
Method: Based on quantitative structure-activity relationship (QSAR) modelling
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.

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Components:

isobutane:

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

pentane:

Mobility : Remarks: Floats on water.
If the product enters soil, one or more constituents will or may be mobile and may contaminate groundwater.

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.

Components:

isobutane:

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.

pentane:

Results of PBT and vPvB assessment : The substance does not fulfill all screening criteria for persistence, bioaccumulation and toxicity and hence is not considered to be PBT or vPvB.

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.

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 com-

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bustion in purpose-designed equipment. If this is not possible, contact the supplier.

MARPOL - see International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) which provides technical aspects at controlling pollutions from ships.

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 the collector or contractor should be established beforehand.

Local legislation
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.

SECTION 14. TRANSPORT INFORMATION

TDG

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

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

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Maritime transport in bulk according to IMO instruments

MARPOL Annex 1 rules apply for bulk shipments by sea.

Special precautions for user

Not applicable

SECTION 15. REGULATORY INFORMATION

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

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

This product has been classified in accordance with the hazard criteria of the Hazardous Products Regulations (HPR) and the SDS contains all the information required by the HPR.

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

DSL : All components listed.

TSCA : All components listed.

SECTION 16. OTHER INFORMATION

Full text of other abbreviations

ACGIH	: USA. ACGIH Threshold Limit Values (TLV)
CA BC OEL	: Canada. British Columbia OEL
ACGIH / TWA	: 8-hour, time-weighted average
ACGIH / STEL	: Short-term exposure limit
CA BC OEL / TWA	: 8-hour time weighted average

AIIC - Australian Inventory of Industrial Chemicals; ANTT - National Agency for Transport by Land of Brazil; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECl - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; Nch - Chilean Norm; NO(A)EC - No Observed (Adverse) Effect

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Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NOM - Official Mexican Norm; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TDG - Transportation of Dangerous Goods; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative; WHMIS - Workplace Hazardous Materials Information System

Revision Date : 2025-05-08
Date format : mm/dd/yyyy

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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