

# SAFETY DATA SHEET

Flammable Liquefied Gas Mixture: 1-Butene / 1-Pentene / 1,3-Butadiene / 2-Methyl-1-Butene / 2-Methyl-2-Butene / 3-Methyl-1-Butene / Benzene / Cis-2-Butene / Cis-2-Pentene / Cyclopentane / Ethane / Ethylene / Hexane / Isobutane / Isobutylene / Isopentane / Methane / N-Butane / N-Pentane / Neopentane / Propane / Propylene / Trans-2-Butene / Trans-2-Pentene

## Section 1. Identification

<b>GHS product identifier</b>	: Flammable Liquefied Gas Mixture: 1-Butene / 1-Pentene / 1,3-Butadiene / 2-Methyl-1-Butene / 2-Methyl-2-Butene / 3-Methyl-1-Butene / Benzene / Cis-2-Butene / Cis-2-Pentene / Cyclopentane / Ethane / Ethylene / Hexane / Isobutane / Isobutylene / Isopentane / Methane / N-Butane / N-Pentane / Neopentane / Propane / Propylene / Trans-2-Butene / Trans-2-Pentene
<b>Other means of identification</b>	: Not available.
<b>Product use</b>	: Synthetic/Analytical chemistry.
<b>SDS #</b>	: 012601
<b>Supplier's details</b>	: Airgas USA, LLC and its affiliates 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
<b>Emergency telephone number (with hours of operation)</b>	: 1-866-734-3438

## Section 2. Hazards identification

<b>OSHA/HCS status</b>	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
<b>Classification of the substance or mixture</b>	: FLAMMABLE GASES - Category 1 GASES UNDER PRESSURE - Liquefied gas GERM CELL MUTAGENICITY - Category 1B CARCINOGENICITY - Category 1 TOXIC TO REPRODUCTION (Fertility) - Category 2 TOXIC TO REPRODUCTION (Unborn child) - Category 2 SPECIFIC TARGET ORGAN TOXICITY (REPEATED EXPOSURE) - Category 2 AQUATIC HAZARD (LONG-TERM) - Category 3

### GHS label elements

#### Hazard pictograms



#### Signal word

: Danger

#### Hazard statements

: Extremely flammable gas.  
Contains gas under pressure; may explode if heated.  
May cause frostbite.  
May displace oxygen and cause rapid suffocation.  
May cause genetic defects.  
May cause cancer.  
Suspected of damaging fertility or the unborn child.  
May cause damage to organs through prolonged or repeated exposure.  
Harmful to aquatic life with long lasting effects.

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## Section 2. Hazards identification

### Precautionary statements

#### General

: Read and follow all Safety Data Sheets (SDS'S) before use. Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Close valve after each use and when empty. Use equipment rated for cylinder pressure. Do not open valve until connected to equipment prepared for use. Use a back flow preventative device in the piping. Use only equipment of compatible materials of construction. Always keep container in upright position. Approach suspected leak area with caution.

#### Prevention

: Never Put cylinders into unventilated areas of passenger vehicles. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Use personal protective equipment as required. Keep away from heat, sparks, open flames and hot surfaces. - No smoking. Avoid release to the environment. Do not breathe gas.

#### Response

: Get medical attention if you feel unwell. IF exposed or concerned: Get medical attention. Leaking gas fire: Do not extinguish, unless leak can be stopped safely. Eliminate all ignition sources if safe to do so.

#### Storage

: Store locked up. Protect from sunlight. Protect from sunlight when ambient temperature exceeds 52°C/125°F. Store in a well-ventilated place.

#### Disposal

: Dispose of contents and container in accordance with all local, regional, national and international regulations.

#### Hazards not otherwise classified

: Liquid can cause burns similar to frostbite.

## Section 3. Composition/information on ingredients

#### Substance/mixture

: Mixture

#### Other means of identification

: Not available.

#### CAS number/other identifiers

##### CAS number

: Not applicable.

##### Product code

: 012601

Ingredient name	%	CAS number
Propane	0.1 - 99	74-98-6
(E)-but-2-ene	1 - 10	624-64-6
propene	0.01 - 10	115-07-1
methane	0.0001 - 10	74-82-8
isopentane	1 - 5	78-78-4
pentane	0.0001 - 5	109-66-0
n-hexane	1 - 5	110-54-3
Butane	0.0001 - 5	106-97-8
2-methylpropene	0.0001 - 5	115-11-7
isobutane	0.0001 - 5	75-28-5
(Z)-but-2-ene	0.0001 - 5	590-18-1
but-1-ene	0.0001 - 5	106-98-9
3-methylbut-1-ene	0.0001 - 1	563-45-1
benzene	0.0999 - 0.9999	71-43-2
2-methylbut-1-ene	0.0001 - 0.9999	563-46-2
2 - methyl - 2 - butene	0.0001 - 0.9999	513-35-9
pent-1-ene	0.0001 - 0.9999	109-67-1
cyclopentane	0.0001 - 0.9999	287-92-3
1,3-butadiene	0.0001 - 0.9999	106-99-0
ethylene	0.0001 - 0.9999	74-85-1

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## Section 3. Composition/information on ingredients

trans-pent-2-ene	0.0001 - 0.9999	646-04-8
(Z)-pent-2-ene	0.0001 - 0.0999	627-20-3

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

## Section 4. First aid measures

### Description of necessary first aid measures

- Eye contact** : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention.
- Inhalation** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Skin contact** : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. To avoid the risk of static discharges and gas ignition, soak contaminated clothing thoroughly with water before removing it. Continue to rinse for at least 10 minutes. Get medical attention. In case of contact with liquid, warm frozen tissues slowly with lukewarm water and get medical attention. Do not rub affected area. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention. Ingestion of liquid can cause burns similar to frostbite. If frostbite occurs, get medical attention. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. As this product rapidly becomes a gas when released, refer to the inhalation section.

### Most important symptoms/effects, acute and delayed

#### Potential acute health effects

- Eye contact** : Liquid can cause burns similar to frostbite.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Ingestion** : Ingestion of liquid can cause burns similar to frostbite.

#### Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:  
frostbite
- Inhalation** : Adverse symptoms may include the following:  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:  
frostbite  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations

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## Section 4. First aid measures

- Ingestion** : Adverse symptoms may include the following:  
frostbite  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations

### Indication of immediate medical attention and special treatment needed, if necessary

- Notes to physician** : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.
- Specific treatments** : No specific treatment.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

## Section 5. Fire-fighting measures

### Extinguishing media

- Suitable extinguishing media** : Use an extinguishing agent suitable for the surrounding fire.
- Unsuitable extinguishing media** : None known.

- Specific hazards arising from the chemical** : Contains gas under pressure. Extremely flammable gas. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion. This material is harmful to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

- Hazardous thermal decomposition products** : Decomposition products may include the following materials:  
carbon dioxide  
carbon monoxide

- Special protective actions for fire-fighters** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Contact supplier immediately for specialist advice. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool. If involved in fire, shut off flow immediately if it can be done without risk. If this is impossible, withdraw from area and allow fire to burn. Fight fire from protected location or maximum possible distance. Eliminate all ignition sources if safe to do so.

- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode. For incidents involving large quantities, thermally insulated undergarments and thick textile or leather gloves should be worn.

## Section 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

- For non-emergency personnel** : Accidental releases pose a serious fire or explosion hazard. No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Avoid breathing gas. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- For emergency responders** : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

- Environmental precautions** : Ensure emergency procedures to deal with accidental gas releases are in place to avoid contamination of the environment. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Water polluting material. May be harmful to the environment if released in large quantities.

### Methods and materials for containment and cleaning up

- Small spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment.
- Large spill** : Immediately contact emergency personnel. Stop leak if without risk. Use spark-proof tools and explosion-proof equipment. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

## Section 7. Handling and storage

### Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). Contains gas under pressure. Avoid exposure - obtain special instructions before use. Avoid exposure during pregnancy. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on skin or clothing. Do not breathe gas. Avoid release to the environment. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Empty containers retain product residue and can be hazardous. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

- Conditions for safe storage, including any incompatibilities** : Store in accordance with local regulations. Store in a segregated and approved area. Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store locked up. Eliminate all ignition sources. Keep container tightly closed and sealed until ready for use. Cylinders should be stored upright, with valve protection cap in place, and firmly secured to prevent falling or being knocked over. Cylinder temperatures should not exceed 52 °C (125 °F).

## Section 8. Exposure controls/personal protection

### [Control parameters](#)

#### [Occupational exposure limits](#)

Ingredient name	Exposure limits
isopentane	<b>ACGIH TLV (United States, 3/2012).</b> TWA: 600 ppm 8 hours.
pentane	<b>ACGIH TLV (United States, 3/2012).</b> TWA: 600 ppm 8 hours. <b>NIOSH REL (United States, 1/2013).</b> CEIL: 1800 mg/m <sup>3</sup> 15 minutes. CEIL: 610 ppm 15 minutes. TWA: 350 mg/m <sup>3</sup> 10 hours. TWA: 120 ppm 10 hours. <b>OSHA PEL (United States, 6/2010).</b> TWA: 2950 mg/m <sup>3</sup> 8 hours. TWA: 1000 ppm 8 hours. <b>OSHA PEL 1989 (United States, 3/1989).</b> STEL: 2250 mg/m <sup>3</sup> 15 minutes. STEL: 750 ppm 15 minutes. TWA: 1800 mg/m <sup>3</sup> 8 hours. TWA: 600 ppm 8 hours.
n-hexane	<b>ACGIH TLV (United States, 3/2012).</b> <b>Absorbed through skin.</b> TWA: 50 ppm 8 hours. <b>NIOSH REL (United States, 1/2013).</b> TWA: 180 mg/m <sup>3</sup> 10 hours. TWA: 50 ppm 10 hours. <b>OSHA PEL (United States, 6/2010).</b> TWA: 1800 mg/m <sup>3</sup> 8 hours. TWA: 500 ppm 8 hours. <b>OSHA PEL 1989 (United States, 3/1989).</b> TWA: 180 mg/m <sup>3</sup> 8 hours. TWA: 50 ppm 8 hours.
benzene	<b>ACGIH TLV (United States, 3/2012).</b> <b>Absorbed through skin.</b> STEL: 8 mg/m <sup>3</sup> 15 minutes. STEL: 2.5 ppm 15 minutes. TWA: 1.6 mg/m <sup>3</sup> 8 hours. TWA: 0.5 ppm 8 hours. <b>NIOSH REL (United States, 1/2013).</b> STEL: 1 ppm 15 minutes. TWA: 0.1 ppm 10 hours. <b>OSHA PEL (United States, 6/2010).</b> STEL: 5 ppm 15 minutes. TWA: 1 ppm 8 hours. <b>OSHA PEL 1989 (United States, 3/1989).</b> STEL: 5 ppm 15 minutes. TWA: 1 ppm 8 hours. <b>OSHA PEL Z2 (United States, 11/2006).</b> AMP: 50 ppm 10 minutes. CEIL: 25 ppm TWA: 10 ppm 8 hours.
1,3-butadiene	<b>ACGIH TLV (United States, 3/2012).</b> TWA: 4.4 mg/m <sup>3</sup> 8 hours. TWA: 2 ppm 8 hours.



## Section 8. Exposure controls/personal protection

**OSHA PEL (United States, 6/2010).**

STEL: 5 ppm 15 minutes.

TWA: 1 ppm 8 hours.

**OSHA PEL 1989 (United States, 3/1989).**

STEL: 5 ppm 15 minutes.

TWA: 1 ppm 8 hours.

- Appropriate engineering controls** : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.
- Individual protection measures**
- Hygiene measures** : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.
- Eye/face protection** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.
- Skin protection**
- Hand protection** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. If contact with the liquid is possible, insulated gloves suitable for low temperatures should be worn. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- Body protection** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

## Section 9. Physical and chemical properties

### Appearance

<b>Physical state</b>	: Gas. [Liquefied gas]
<b>Color</b>	: Not available.
<b>Melting/freezing point</b>	: -105°C (-157°F) This is based on data for the following ingredient: (E)-but-2-ene. Weighted average: -176.37°C (-285.5°F)
<b>Critical temperature</b>	: Lowest known value: -82.45°C (-116.4°F) (methane).
<b>Odor</b>	: Not available.
<b>Odor threshold</b>	: Not available.
<b>pH</b>	: Not available.
<b>Flash point</b>	: Not available.
<b>Burning time</b>	: Not applicable.
<b>Burning rate</b>	: Not applicable.
<b>Evaporation rate</b>	: Not available.
<b>Flammability (solid, gas)</b>	: Not available.
<b>Lower and upper explosive (flammable) limits</b>	: Not available.
<b>Vapor pressure</b>	: Not available.
<b>Vapor density</b>	: Highest known value: 2.1 (Air = 1) (Butane). Weighted average: 1.61 (Air = 1)
<b>Gas Density (lb/ft<sup>3</sup>)</b>	: Weighted average: 0.14
<b>Relative density</b>	: Not applicable.
<b>Solubility</b>	: Not available.
<b>Solubility in water</b>	: Not available.
<b>Partition coefficient: n-octanol/water</b>	: Not available.
<b>Auto-ignition temperature</b>	: Not available.
<b>Decomposition temperature</b>	: Not available.
<b>SADT</b>	: Not available.
<b>Viscosity</b>	: Not applicable.

## Section 10. Stability and reactivity

<b>Reactivity</b>	: No specific test data related to reactivity available for this product or its ingredients.
<b>Chemical stability</b>	: The product is stable.
<b>Possibility of hazardous reactions</b>	: Under normal conditions of storage and use, hazardous reactions will not occur.
<b>Conditions to avoid</b>	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.
<b>Incompatibility with various substances</b>	: Extremely reactive or incompatible with the following materials: oxidizing materials. Highly reactive or incompatible with the following materials: acids and moisture.
<b>Hazardous decomposition products</b>	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.



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## Section 10. Stability and reactivity

**Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

## Section 11. Toxicological information

### Information on toxicological effects

#### Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
isopentane	LC50 Inhalation Vapor	Rat	280000 mg/m <sup>3</sup>	4 hours
pentane	LC50 Inhalation Vapor	Rat	364 g/m <sup>3</sup>	4 hours
n-hexane	LC50 Inhalation Gas.	Rat	48000 ppm	4 hours
	LC50 Inhalation Vapor	Rat	96000 ppm	1 hours
	LD50 Oral	Rat	15840 mg/kg	-
benzene	LC50 Inhalation Gas.	Rat	10000 ppm	7 hours
	LD50 Oral	Rat	930 mg/kg	-
1,3-butadiene	LC50 Inhalation Gas.	Rat	128000 ppm	4 hours

#### Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
n-hexane	Eyes - Mild irritant	Rabbit	-	10 milligrams	-
benzene	Eyes - Moderate irritant	Rabbit	-	88 milligrams	-
	Eyes - Severe irritant	Rabbit	-	24 hours 2 milligrams	-
	Skin - Mild irritant	Rat	-	8 hours 60 microliters	-
	Skin - Mild irritant	Rabbit	-	24 hours 15 milligrams	-
	Skin - Moderate irritant	Rabbit	-	24 hours 20 milligrams	-

#### Sensitization

Not available.

#### Mutagenicity

Not available.

#### Carcinogenicity

Not available.

#### Classification

Product/ingredient name	OSHA	IARC	NTP
benzene	+	1	Known to be a human carcinogen.
1,3-butadiene	-	1	Known to be a human carcinogen.

#### Reproductive toxicity

Not available.

#### Teratogenicity

Not available.

#### Specific target organ toxicity (single exposure)

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## Section 11. Toxicological information

Name	Category	Route of exposure	Target organs
isopentane	Category 3	Not applicable.	Narcotic effects
pentane	Category 3	Not applicable.	Narcotic effects
n-hexane	Category 3	Not applicable.	Narcotic effects

### Specific target organ toxicity (repeated exposure)

Name	Category	Route of exposure	Target organs
n-hexane	Category 2	Not determined	Not determined
benzene	Category 1	Not determined	bone marrow

### Aspiration hazard

Name	Result
isopentane	ASPIRATION HAZARD - Category 1
pentane	ASPIRATION HAZARD - Category 1
benzene	ASPIRATION HAZARD - Category 1

**Information on the likely routes of exposure** : Not available.

### Potential acute health effects

- Eye contact** : Liquid can cause burns similar to frostbite.
- Inhalation** : No known significant effects or critical hazards.
- Skin contact** : Dermal contact with rapidly evaporating liquid could result in freezing of the tissues or frostbite.
- Ingestion** : Ingestion of liquid can cause burns similar to frostbite.

### Symptoms related to the physical, chemical and toxicological characteristics

- Eye contact** : Adverse symptoms may include the following:  
frostbite
- Inhalation** : Adverse symptoms may include the following:  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations
- Skin contact** : Adverse symptoms may include the following:  
frostbite  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations
- Ingestion** : Adverse symptoms may include the following:  
frostbite  
reduced fetal weight  
increase in fetal deaths  
skeletal malformations

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

## Section 11. Toxicological information

### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

Not available.

**General** : May cause damage to organs through prolonged or repeated exposure.

**Carcinogenicity** : May cause cancer. Risk of cancer depends on duration and level of exposure.

**Mutagenicity** : May cause genetic defects.

**Teratogenicity** : Suspected of damaging the unborn child.

**Developmental effects** : No known significant effects or critical hazards.

**Fertility effects** : Suspected of damaging fertility.

### Numerical measures of toxicity

#### Acute toxicity estimates

Not available.

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Result	Species	Exposure
n-hexane	Acute LC50 113000 µg/l Fresh water	Fish - Oreochromis mossambicus	96 hours

### Persistence and degradability

Not available.

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
isopentane	3	171	low
pentane	3.45	171	low
n-hexane	4	501.187	high
benzene	2.13	11	low
1,3-butadiene	1.99	10	low

### Mobility in soil

**Soil/water partition coefficient (K<sub>oc</sub>)** : Not available.






**Other adverse effects** : No known significant effects or critical hazards.

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## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Empty Airgas-owned pressure vessels should be returned to Airgas. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Do not puncture or incinerate container.

## Section 14. Transport information

	DOT	TDG	Mexico	IMDG	IATA
<b>UN number</b>	UN3161	UN3161	UN3161	UN3161	UN3161
<b>UN proper shipping name</b>	Liquefied gas, flammable n.o.s. (propane, propene)	Liquefied gas, flammable n.o.s. (propane, propene)	Liquefied gas, flammable n.o.s. (propane, propene)	Liquefied gas, flammable n.o.s. (propane, propene)	Liquefied gas, flammable n.o.s. (propane, propene)
<b>Transport hazard class(es)</b>	2.1 	2.1 	2.1 	2.1 	2.1 
<b>Packing group</b>	-	-	-	-	-
<b>Environment</b>	No.	No.	No.	No.	No.
<b>Additional information</b>	<b>Reportable quantity</b> 1000.1 lbs / 454.05 kg Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.	<b>Explosive Limit and Limited Quantity Index</b> 0.125 <b>ERAP Index</b> 3000 <b>Passenger Carrying Ship Index</b> Forbidden <b>Passenger Carrying Road or Rail Index</b> Forbidden	-	-	-

“Refer to CFR 49 (or authority having jurisdiction) to determine the information required for shipment of the product.”

**Special precautions for user** : **Transport within user’s premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** : Not available.

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## Section 15. Regulatory information

**U.S. Federal regulations** : TSCA 8(a) PAIR: pentane; cyclopentane  
 TSCA 8(a) CDR Exempt/Partial exemption: Not determined  
 TSCA 12(b) one-time export: pentane  
 United States inventory (TSCA 8b): All components are listed or exempted.  
 Clean Water Act (CWA) 307: benzene  
 Clean Water Act (CWA) 311: benzene  
 Clean Air Act (CAA) 112 regulated flammable substances: methane; propene; propane; (E)-but-2-ene; Isopentane; but-1-ene; (Z)-but-2-ene; Isobutane; 2-methylpropene; Butane; pentane; 3-methylbut-1-ene

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : Listed

**Clean Air Act Section 602 Class I Substances** : Not listed

**Clean Air Act Section 602 Class II Substances** : Not listed

**DEA List I Chemicals (Precursor Chemicals)** : Not listed

**DEA List II Chemicals (Essential Chemicals)** : Not listed

**SARA 302/304**

Composition/information on ingredients

No products were found.

**SARA 304 RQ** : Not applicable.

**SARA 311/312**

**Classification** : Fire hazard  
 Sudden release of pressure  
 Delayed (chronic) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
isopentane	1 - 5	Yes.	No.	No.	Yes.	No.
pentane	0.0001 - 5	Yes.	No.	No.	Yes.	No.
n-hexane	1 - 5	Yes.	No.	No.	Yes.	Yes.
benzene	0.0999 - 0.9999	Yes.	No.	No.	Yes.	Yes.
1,3-butadiene	0.0001 - 0.9999	Yes.	Yes.	Yes.	No.	Yes.

**SARA 313**

## Section 15. Regulatory information

	Product name	CAS number	%
<b>Form R - Reporting requirements</b>	propene	115-07-1	0.01 - 10
	n-hexane	110-54-3	1 - 5
	benzene	71-43-2	0.0999 - 0.9999
	1,3-butadiene	106-99-0	0.0001 - 0.9999
<b>Supplier notification</b>	propene	115-07-1	0.01 - 10
	n-hexane	110-54-3	1 - 5
	benzene	71-43-2	0.0999 - 0.9999
	1,3-butadiene	106-99-0	0.0001 - 0.9999

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

### State regulations

#### Massachusetts

: The following components are listed: METHANE; PROPYLENE (PROPENE); PROPANE; 2-BUTENE-TRANS; ISOPENTANE; 1-BUTENE; 2-BUTENE-CIS; ISOBUTANE; 2-METHYLPROPENE; BUTANE; HEXANE; PENTANE; 3-METHYL-1-BUTENE

#### New York

: The following components are listed: Hexane; Benzene

#### New Jersey

: The following components are listed: METHANE; PROPYLENE; 1-PROPENE; PROPANE; 2-BUTENE-trans; 2-BUTENE, (2E)-; ISOPENTANE; BUTANE, 2-METHYL-; 1-BUTENE; 2-BUTENE-cis; 2-BUTENE, (2Z)-; Isobutane; PROPANE, 2-METHYL-; ISOBUTYLENE; 1-PROPENE, 2-METHYL-; BUTANE; n-HEXANE; HEXANE; PENTANE; 3-METHYL-1-BUTENE; 1-BUTENE, 3-METHYL-; BENZENE; 1, 3-BUTADIENE; BIETHYLENE

#### Pennsylvania

: The following components are listed: METHANE; 1-PROPENE; PROPANE; 2-BUTENE, (E)-; BUTANE, 2-METHYL-; 1-BUTENE; 2-BUTENE, (Z)-; PROPANE, 2-METHYL-; 1-PROPENE, 2-METHYL-; BUTANE; HEXANE; PENTANE; 1-BUTENE, 3-METHYL-; BENZENE; 1,3-BUTADIENE

### California Prop. 65

**WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
benzene	Yes.	Yes.	6.4 µg/day (ingestion) 13 µg/day (inhalation)	24 µg/day (ingestion) 49 µg/day (inhalation)
1,3-butadiene	Yes.	Yes.	Yes.	No.

### Canada inventory

: All components are listed or exempted.

### International regulations

#### International lists

: **Australia inventory (AICS):** Not determined.  
**China inventory (IECSC):** Not determined.  
**Japan inventory:** All components are listed or exempted.  
**Korea inventory:** All components are listed or exempted.  
**Malaysia Inventory (EHS Register):** Not determined.  
**New Zealand Inventory of Chemicals (NZIoC):** Not determined.  
**Philippines inventory (PICCS):** Not determined.  
**Taiwan inventory (CSNN):** Not determined.

### Chemical Weapons

: Not listed

### Convention List Schedule

### I Chemicals



Flammable Liquefied Gas Mixture: 1-Butene / 1-Pentene / 1,3-Butadiene / 2-Methyl-1-Butene / 2-Methyl-2-Butene / 3-Methyl-1-Butene / Benzene / Cis-2-Butene / Cis-2-Pentene / Cyclopentane / Ethane / Ethylene / Hexane / Isobutane / Isobutylene / Isopentane / Methane / N-Butane / N-Pentane / Neopentane / Propane / Propylene / Trans-2-Butene / Trans-2-Pentene

## Section 15. Regulatory information

**Chemical Weapons Convention List Schedule II Chemicals** : Not listed

**Chemical Weapons Convention List Schedule III Chemicals** : Not listed

### Canada

**WHMIS (Canada)** : Class A: Compressed gas.  
Class B-1: Flammable gas.  
Class D-2A: Material causing other toxic effects (Very toxic).  
Class D-2B: Material causing other toxic effects (Toxic).  
**CEPA Toxic substances:** The following components are listed: Methane; Benzene; 1, 3-Butadiene  
**Canadian ARET:** None of the components are listed.  
**Canadian NPRI:** The following components are listed: Volatile organic compounds; Propylene; Propane; Butene (all isomers); Pentane (all isomers); Butene (all isomers); Butene (all isomers); Butane (all isomers); Butane (all isomers); Butane (all isomers); n-Hexane; Pentane (all isomers)  
**Alberta Designated Substances:** None of the components are listed.  
**Ontario Designated Substances:** None of the components are listed.  
**Quebec Designated Substances:** None of the components are listed.

## Section 16. Other information

**Canada Label requirements** : Class A: Compressed gas.  
Class B-1: Flammable gas.  
Class D-2A: Material causing other toxic effects (Very toxic).  
Class D-2B: Material causing other toxic effects (Toxic).

### Hazardous Material Information System (U.S.A.)

Health	*	2
Flammability		4
Physical hazards		0

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

### National Fire Protection Association (U.S.A.)



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## Section 16. Other information

Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

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Key to abbreviations : ATE = Acute Toxicity Estimate  
BCF = Bioconcentration Factor  
GHS = Globally Harmonized System of Classification and Labelling of Chemicals  
IATA = International Air Transport Association  
IBC = Intermediate Bulk Container  
IMDG = International Maritime Dangerous Goods  
LogPow = logarithm of the octanol/water partition coefficient  
MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)  
UN = United Nations  
ACGIH – American Conference of Governmental Industrial Hygienists  
AIHA – American Industrial Hygiene Association  
CAS – Chemical Abstract Services  
CEPA – Canadian Environmental Protection Act  
CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act (EPA)  
CFR – United States Code of Federal Regulations  
CPR – Controlled Products Regulations  
DSL – Domestic Substances List  
GWP – Global Warming Potential  
IARC – International Agency for Research on Cancer  
ICAO – International Civil Aviation Organisation  
Inh – Inhalation  
LC – Lethal concentration  
LD – Lethal dosage  
NDSL – Non-Domestic Substances List  
NIOSH – National Institute for Occupational Safety and Health  
TDG – Canadian Transportation of Dangerous Goods Act and Regulations  
TLV – Threshold Limit Value  
TSCA – Toxic Substances Control Act  
WEEL – Workplace Environmental Exposure Level  
WHMIS – Canadian Workplace Hazardous Material Information System

References : Not available.

Indicates information that has changed from previously issued version.

### Notice to reader

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.