

Material Safety Data Sheet



Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

Section 1. Chemical product and company identification

Product name	: Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene
Supplier	: AIRGAS INC., on behalf of its subsidiaries 259 North Radnor-Chester Road Suite 100 Radnor, PA 19087-5283 1-610-687-5253
Product use	: Synthetic/Analytical chemistry.
MSDS #	: 006732
Date of Preparation/Revision	: 2/2/2011.
In case of emergency	: 1-866-734-3438

Section 2. Hazards identification

Physical state	: Gas.
Emergency overview	: DANGER! FLAMMABLE GAS. MAY CAUSE FLASH FIRE. HARMFUL IF INHALED OR SWALLOWED. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE SKIN IRRITATION. CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE. CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER. CAUSES SEVERE EYE IRRITATION. CONTENTS UNDER PRESSURE. Keep away from heat, sparks and flame. Do not puncture or incinerate container. Do not ingest. Avoid breathing gas. Avoid contact with eyes, skin and clothing. Contains material that can cause target organ damage. Risk of cancer depends on duration and level of exposure. Use only with adequate ventilation. Wash thoroughly after handling. Keep container closed. Avoid breathing gas. Contact with rapidly expanding gases can cause frostbite.
Target organs	: Contains material which causes damage to the following organs: upper respiratory tract, skin. Contains material which may cause damage to the following organs: blood, kidneys, lungs, the nervous system, the reproductive system, liver, mucous membranes, heart, peripheral nervous system, cardiovascular system, bone marrow, central nervous system (CNS), eye, lens or cornea, muscle tissue.
Routes of entry	: Inhalation Dermal Eyes
Potential acute health effects	
Eyes	: Severely irritating to eyes. Risk of serious damage to eyes. Contact with rapidly expanding gas may cause burns or frostbite.
Skin	: Moderately irritating to the skin. Contact with rapidly expanding gas may cause burns or frostbite.
Inhalation	: Toxic by inhalation. Irritating to respiratory system.
Ingestion	: Ingestion is not a normal route of exposure for gases

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Potential chronic health effects

- Chronic effects** : Contains material that can cause target organ damage.
- Carcinogenicity** : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.
- Target organs** : Contains material which causes damage to the following organs: upper respiratory tract, skin.
Contains material which may cause damage to the following organs: blood, kidneys, lungs, the nervous system, the reproductive system, liver, mucous membranes, heart, peripheral nervous system, cardiovascular system, bone marrow, central nervous system (CNS), eye, lens or cornea, muscle tissue.

- Medical conditions aggravated by over-exposure** : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

Section 3. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% Volume</u>	<u>Exposure limits</u>
Nitrogen	7727-37-9	1 - 77	Oxygen Depletion [Asphyxiant]
Propane	74-98-6	5 - 10	ACGIH TLV (United States, 2/2010). TWA: 1000 ppm 8 hour(s). NIOSH REL (United States, 6/2009). TWA: 1800 mg/m ³ 10 hour(s). TWA: 1000 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 1800 mg/m ³ 8 hour(s). TWA: 1000 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). TWA: 1800 mg/m ³ 8 hour(s). TWA: 1000 ppm 8 hour(s).
Methane	74-82-8	4 - 10	ACGIH TLV (United States, 2/2010). TWA: 1000 ppm 8 hour(s).
Isobutane	75-28-5	2.5 - 10	ACGIH TLV (United States, 2/2010). TWA: 1000 ppm 8 hour(s). NIOSH REL (United States, 6/2009). TWA: 1900 mg/m ³ 10 hour(s). TWA: 800 ppm 10 hour(s).
Ethane	74-84-0	0.1 - 10	ACGIH TLV (United States, 2/2010). TWA: 1000 ppm 8 hour(s).
Propylene	115-07-1	1 - 10	ACGIH TLV (United States, 1/2005). TWA: 500 ppm 8 hour(s). Form: All forms ACGIH TLV (United States, 2/2010). TWA: 500 ppm 8 hour(s).
Carbon Dioxide	124-38-9	0.5 - 10	ACGIH TLV (United States, 2/2010). STEL: 54000 mg/m ³ 15 minute(s). STEL: 30000 ppm 15 minute(s). TWA: 9000 mg/m ³ 8 hour(s). TWA: 5000 ppm 8 hour(s). NIOSH REL (United States, 6/2009). STEL: 54000 mg/m ³ 15 minute(s). STEL: 30000 ppm 15 minute(s). TWA: 9000 mg/m ³ 10 hour(s). TWA: 5000 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 9000 mg/m ³ 8 hour(s). TWA: 5000 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 54000 mg/m ³ 15 minute(s).

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Argon	7440-37-1	1 - 10	STEL: 30000 ppm 15 minute(s). TWA: 18000 mg/m ³ 8 hour(s). TWA: 10000 ppm 8 hour(s). Oxygen Depletion [Asphyxiant]
N-Butane	106-97-8	0.08 - 5	ACGIH TLV (United States, 2/2010). TWA: 1000 ppm 8 hour(s). NIOSH REL (United States, 6/2009). TWA: 1900 mg/m ³ 10 hour(s). TWA: 800 ppm 10 hour(s). OSHA PEL 1989 (United States, 3/1989). TWA: 1900 mg/m ³ 8 hour(s). TWA: 800 ppm 8 hour(s).
Trans-2-Butene	624-64-6	1 - 5	ACGIH TLV (United States, 2/2010). TWA: 250 ppm 8 hour(s).
Methyl Acetylene	74-99-7	1 - 5	ACGIH TLV (United States, 2/2010). TWA: 1640 mg/m ³ 8 hour(s). TWA: 1000 ppm 8 hour(s). NIOSH REL (United States, 6/2009). TWA: 1650 mg/m ³ 10 hour(s). TWA: 1000 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 1650 mg/m ³ 8 hour(s). TWA: 1000 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). TWA: 1650 mg/m ³ 8 hour(s). TWA: 1000 ppm 8 hour(s).
Ethylene	74-85-1	1 - 5	ACGIH TLV (United States, 2/2010). TWA: 200 ppm 8 hour(s).
Cis-2-Butene	590-18-1	1 - 5	ACGIH TLV (United States, 2/2010). TWA: 250 ppm 8 hour(s).
1-Butene	106-98-9	1 - 5	ACGIH TLV (United States, 2/2010). TWA: 250 ppm 8 hour(s).
1,2-Propadiene (Allene)	463-49-0	1 - 5	TLV (Philippines, 1/1978). TLV: 1800 mg/m ³ 8 hour(s). TLV: 1000 ppm 8 hour(s). Ministry of Labor (Republic of Korea, 6/2010). STEL: 1250 ppm 15 minute(s). STEL: 2250 mg/m ³ 15 minute(s). TWA: 1000 ppm 8 hour(s). TWA: 1800 mg/m ³ 8 hour(s).
Isobutylene	115-11-7	1 - 5	ACGIH TLV (United States, 2/2010). TWA: 250 ppm 8 hour(s).
Carbon Monoxide	630-08-0	0.0025 - 5	ACGIH TLV (United States, 2/2010). TWA: 29 mg/m ³ 8 hour(s). TWA: 25 ppm 8 hour(s). NIOSH REL (United States, 6/2009). CEIL: 229 mg/m ³ CEIL: 200 ppm TWA: 40 mg/m ³ 10 hour(s). TWA: 35 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 55 mg/m ³ 8 hour(s). TWA: 50 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). CEIL: 229 mg/m ³ CEIL: 200 ppm TWA: 40 mg/m ³ 8 hour(s). TWA: 35 ppm 8 hour(s).
Acetylene	74-86-2	0.5 - 5	NIOSH REL (United States, 6/2009).

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1,3-Butadiene	106-99-0	0.0002 - 4	CEIL: 2662 mg/m ³ CEIL: 2500 ppm ACGIH TLV (United States, 2/2010). TWA: 4.4 mg/m ³ 8 hour(s). TWA: 2 ppm 8 hour(s). OSHA PEL (United States, 6/2010). STEL: 5 ppm 15 minute(s). TWA: 1 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 5 ppm 15 minute(s). TWA: 1 ppm 8 hour(s).
N-Pentane	109-66-0	0.06 - 3	ACGIH TLV (United States, 2/2010). TWA: 600 ppm 8 hour(s). NIOSH REL (United States, 6/2009). CEIL: 1800 mg/m ³ 15 minute(s). CEIL: 610 ppm 15 minute(s). TWA: 350 mg/m ³ 10 hour(s). TWA: 120 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 2950 mg/m ³ 8 hour(s). TWA: 1000 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 2250 mg/m ³ 15 minute(s). STEL: 750 ppm 15 minute(s). TWA: 1800 mg/m ³ 8 hour(s). TWA: 600 ppm 8 hour(s).
Isopentane	78-78-4	0.06 - 2	ACGIH TLV (United States, 2/2010). TWA: 600 ppm 8 hour(s).
1-Hexene	592-41-6	0.005 - 1	ACGIH TLV (United States, 2/2010). TWA: 50 ppm 8 hour(s).
N-Hexane	110-54-3	0.005 - 1	ACGIH TLV (United States, 2/2010). Absorbed through skin. TWA: 50 ppm 8 hour(s). NIOSH REL (United States, 6/2009). TWA: 180 mg/m ³ 10 hour(s). TWA: 50 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 1800 mg/m ³ 8 hour(s). TWA: 500 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). TWA: 180 mg/m ³ 8 hour(s). TWA: 50 ppm 8 hour(s).
n-Heptane	142-82-5	0.04 - 1	ACGIH TLV (United States, 2/2010). STEL: 2050 mg/m ³ 15 minute(s). STEL: 500 ppm 15 minute(s). TWA: 1640 mg/m ³ 8 hour(s). TWA: 400 ppm 8 hour(s). NIOSH REL (United States, 6/2009). CEIL: 1800 mg/m ³ 15 minute(s). CEIL: 440 ppm 15 minute(s). TWA: 350 mg/m ³ 10 hour(s). TWA: 85 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 2000 mg/m ³ 8 hour(s). TWA: 500 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 2000 mg/m ³ 15 minute(s). STEL: 500 ppm 15 minute(s). TWA: 1600 mg/m ³ 8 hour(s). TWA: 400 ppm 8 hour(s).

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Toluene	108-88-3	0.005 - 1	<p>ACGIH TLV (United States, 2/2010). TWA: 20 ppm 8 hour(s).</p> <p>NIOSH REL (United States, 6/2009). STEL: 560 mg/m³ 15 minute(s). STEL: 150 ppm 15 minute(s). TWA: 375 mg/m³ 10 hour(s). TWA: 100 ppm 10 hour(s).</p> <p>OSHA PEL 1989 (United States, 3/1989). STEL: 560 mg/m³ 15 minute(s). STEL: 150 ppm 15 minute(s). TWA: 375 mg/m³ 8 hour(s). TWA: 100 ppm 8 hour(s).</p> <p>OSHA PEL Z2 (United States, 11/2006). AMP: 500 ppm 10 minute(s). CEIL: 300 ppm TWA: 200 ppm 8 hour(s).</p>
Octane	111-65-9	0.03 - 1	<p>OSHA PEL 1989 (United States, 3/1989). TWA: 300 ppm 8 hour(s). TWA: 1450 mg/m³ 8 hour(s). STEL: 375 ppm 15 minute(s). STEL: 1800 mg/m³ 15 minute(s).</p> <p>NIOSH REL (United States, 6/2009). TWA: 75 ppm 10 hour(s). TWA: 350 mg/m³ 10 hour(s). CEIL: 385 ppm 15 minute(s). CEIL: 1800 mg/m³ 15 minute(s).</p> <p>ACGIH TLV (United States, 2/2010). TWA: 300 ppm 8 hour(s).</p> <p>OSHA PEL (United States, 6/2010). TWA: 500 ppm 8 hour(s). TWA: 2350 mg/m³ 8 hour(s).</p>
Benzene	71-43-2	0.00005 - 1	<p>ACGIH TLV (United States, 2/2010). Absorbed through skin. STEL: 8 mg/m³ 15 minute(s). STEL: 2.5 ppm 15 minute(s). TWA: 1.6 mg/m³ 8 hour(s). TWA: 0.5 ppm 8 hour(s).</p> <p>NIOSH REL (United States, 6/2009). STEL: 1 ppm 15 minute(s). TWA: 0.1 ppm 10 hour(s).</p> <p>OSHA PEL (United States, 6/2010). STEL: 5 ppm 15 minute(s). TWA: 1 ppm 8 hour(s).</p> <p>OSHA PEL 1989 (United States, 3/1989). STEL: 5 ppm 15 minute(s). TWA: 1 ppm 8 hour(s).</p> <p>OSHA PEL Z2 (United States, 11/2006). AMP: 50 ppm 10 minute(s). CEIL: 25 ppm TWA: 10 ppm 8 hour(s).</p>

Section 4. First aid measures

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.

Eye contact

- Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

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- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : As this product is a gas, refer to the inhalation section.

Section 5. Fire-fighting measures

- Flammability of the product** : Flammable.
- Auto-ignition temperature** : Lowest known value: 305°C (581°F) (Ethyne).
- Flash point** : Lowest known value: Closed cup: -188.15°C (-306.7°F). (Methane)
- Flammable limits** : Greatest known range: Lower: 2.5% Upper: 100% (Ethyne)
- Products of combustion** : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
- Fire-fighting media and instructions** : In case of fire, use water spray (fog), foam or dry chemical.

In case of fire, allow gas to burn if flow cannot be shut off immediately. Apply water from a safe distance to cool container and protect surrounding area. If involved in fire, shut off flow immediately if it can be done without risk.

Contains gas under pressure. Extremely flammable. In a fire or if heated, a pressure increase will occur and the container may burst or explode. Gas may accumulate in low or confined areas or travel a considerable distance to a source of ignition and flash back, causing fire or explosion.

- 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.

Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Keep unnecessary personnel away. Use suitable protective equipment (section 8). Shut off gas supply if this can be done safely. Isolate area until gas has dispersed.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : Immediately contact emergency personnel. Stop leak if without risk. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

- Handling** : Use only with adequate ventilation. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling. High pressure gas. Do not puncture or incinerate container. Use equipment rated for cylinder pressure. Close valve after each use and when empty. Do not ingest. Keep container closed. Avoid contact with skin and clothing. Avoid contact with eyes. Keep away from heat, sparks and flame. To avoid fire, eliminate ignition sources. Protect cylinders from physical damage; do not drag, roll, slide, or drop. Use a suitable hand truck for cylinder movement.
- Storage** : Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame). Segregate from oxidizing materials. 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).

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Section 8. Exposure controls/personal protection

- 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.
- Personal protection**
- Eyes** : 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 or dusts.
- Skin** : 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.
- Respiratory** : 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.
- The applicable standards are (US) 29 CFR 1910.134 and (Canada) Z94.4-93
- Hands** : 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.
- Personal protection in case of a large spill** : Self-contained breathing apparatus (SCBA) should be used to avoid inhalation of the product. Full chemical-resistant suit and self-contained breathing apparatus should be worn only by trained and authorized persons.

Product name

Nitrogen
Propane

Oxygen Depletion [Asphyxiant]
ACGIH TLV (United States, 2/2010).
TWA: 1000 ppm 8 hour(s).
NIOSH REL (United States, 6/2009).
TWA: 1800 mg/m³ 10 hour(s).
TWA: 1000 ppm 10 hour(s).
OSHA PEL (United States, 6/2010).
TWA: 1800 mg/m³ 8 hour(s).
TWA: 1000 ppm 8 hour(s).
OSHA PEL 1989 (United States, 3/1989).
TWA: 1800 mg/m³ 8 hour(s).
TWA: 1000 ppm 8 hour(s).

Methane

ACGIH TLV (United States, 2/2010).
TWA: 1000 ppm 8 hour(s).

Isobutane

ACGIH TLV (United States, 2/2010).
TWA: 1000 ppm 8 hour(s).
NIOSH REL (United States, 6/2009).
TWA: 1900 mg/m³ 10 hour(s).
TWA: 800 ppm 10 hour(s).

Ethane

ACGIH TLV (United States, 2/2010).
TWA: 1000 ppm 8 hour(s).

Propene

ACGIH TLV (United States, 1/2005).
TWA: 500 ppm 8 hour(s). Form: All forms
ACGIH TLV (United States, 2/2010).
TWA: 500 ppm 8 hour(s).

Carbon dioxide

ACGIH TLV (United States, 2/2010).
STEL: 54000 mg/m³ 15 minute(s).
STEL: 30000 ppm 15 minute(s).
TWA: 9000 mg/m³ 8 hour(s).
TWA: 5000 ppm 8 hour(s).
NIOSH REL (United States, 6/2009).
STEL: 54000 mg/m³ 15 minute(s).

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STEL: 30000 ppm 15 minute(s).

TWA: 9000 mg/m³ 10 hour(s).

TWA: 5000 ppm 10 hour(s).

OSHA PEL (United States, 6/2010).

TWA: 9000 mg/m³ 8 hour(s).

TWA: 5000 ppm 8 hour(s).

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

STEL: 54000 mg/m³ 15 minute(s).

STEL: 30000 ppm 15 minute(s).

TWA: 18000 mg/m³ 8 hour(s).

TWA: 10000 ppm 8 hour(s).

Argon

Butane

Oxygen Depletion [Asphyxiant]

ACGIH TLV (United States, 2/2010).

TWA: 1000 ppm 8 hour(s).

NIOSH REL (United States, 6/2009).

TWA: 1900 mg/m³ 10 hour(s).

TWA: 800 ppm 10 hour(s).

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

TWA: 1900 mg/m³ 8 hour(s).

TWA: 800 ppm 8 hour(s).

(E)-but-2-ene

ACGIH TLV (United States, 2/2010).

TWA: 250 ppm 8 hour(s).

Propyne

ACGIH TLV (United States, 2/2010).

TWA: 1640 mg/m³ 8 hour(s).

TWA: 1000 ppm 8 hour(s).

NIOSH REL (United States, 6/2009).

TWA: 1650 mg/m³ 10 hour(s).

TWA: 1000 ppm 10 hour(s).

OSHA PEL (United States, 6/2010).

TWA: 1650 mg/m³ 8 hour(s).

TWA: 1000 ppm 8 hour(s).

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

TWA: 1650 mg/m³ 8 hour(s).

TWA: 1000 ppm 8 hour(s).

Ethylene

ACGIH TLV (United States, 2/2010).

TWA: 200 ppm 8 hour(s).

(Z)-but-2-ene

ACGIH TLV (United States, 2/2010).

TWA: 250 ppm 8 hour(s).

but-1-ene

ACGIH TLV (United States, 2/2010).

TWA: 250 ppm 8 hour(s).

allene

TLV (Philippines, 1/1978).

TLV: 1800 mg/m³ 8 hour(s).

TLV: 1000 ppm 8 hour(s).

Ministry of Labor (Republic of Korea, 6/2010).

STEL: 1250 ppm 15 minute(s).

STEL: 2250 mg/m³ 15 minute(s).

TWA: 1000 ppm 8 hour(s).

TWA: 1800 mg/m³ 8 hour(s).

2-methylpropene

ACGIH TLV (United States, 2/2010).

TWA: 250 ppm 8 hour(s).

Carbon monoxide

ACGIH TLV (United States, 2/2010).

TWA: 29 mg/m³ 8 hour(s).

TWA: 25 ppm 8 hour(s).

NIOSH REL (United States, 6/2009).

CEIL: 229 mg/m³

CEIL: 200 ppm

TWA: 40 mg/m³ 10 hour(s).

TWA: 35 ppm 10 hour(s).

OSHA PEL (United States, 6/2010).

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	TWA: 55 mg/m ³ 8 hour(s). TWA: 50 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). CEIL: 229 mg/m ³ CEIL: 200 ppm TWA: 40 mg/m ³ 8 hour(s). TWA: 35 ppm 8 hour(s).
Ethyne	NIOSH REL (United States, 6/2009). CEIL: 2662 mg/m ³ CEIL: 2500 ppm
1,3-Butadiene	ACGIH TLV (United States, 2/2010). TWA: 4.4 mg/m ³ 8 hour(s). TWA: 2 ppm 8 hour(s). OSHA PEL (United States, 6/2010). STEL: 5 ppm 15 minute(s). TWA: 1 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 5 ppm 15 minute(s). TWA: 1 ppm 8 hour(s).
Pentane	ACGIH TLV (United States, 2/2010). TWA: 600 ppm 8 hour(s). NIOSH REL (United States, 6/2009). CEIL: 1800 mg/m ³ 15 minute(s). CEIL: 610 ppm 15 minute(s). TWA: 350 mg/m ³ 10 hour(s). TWA: 120 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 2950 mg/m ³ 8 hour(s). TWA: 1000 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 2250 mg/m ³ 15 minute(s). STEL: 750 ppm 15 minute(s). TWA: 1800 mg/m ³ 8 hour(s). TWA: 600 ppm 8 hour(s).
Isopentane	ACGIH TLV (United States, 2/2010). TWA: 600 ppm 8 hour(s).
hex-1-ene	ACGIH TLV (United States, 2/2010). TWA: 50 ppm 8 hour(s).
n-Hexane	ACGIH TLV (United States, 2/2010). Absorbed through skin. TWA: 50 ppm 8 hour(s). NIOSH REL (United States, 6/2009). TWA: 180 mg/m ³ 10 hour(s). TWA: 50 ppm 10 hour(s). OSHA PEL (United States, 6/2010). TWA: 1800 mg/m ³ 8 hour(s). TWA: 500 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). TWA: 180 mg/m ³ 8 hour(s). TWA: 50 ppm 8 hour(s).
n-Heptane	ACGIH TLV (United States, 2/2010). STEL: 2050 mg/m ³ 15 minute(s). STEL: 500 ppm 15 minute(s). TWA: 1640 mg/m ³ 8 hour(s). TWA: 400 ppm 8 hour(s). NIOSH REL (United States, 6/2009). CEIL: 1800 mg/m ³ 15 minute(s). CEIL: 440 ppm 15 minute(s). TWA: 350 mg/m ³ 10 hour(s). TWA: 85 ppm 10 hour(s). OSHA PEL (United States, 6/2010).

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

	<p>TWA: 2000 mg/m³ 8 hour(s). TWA: 500 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 2000 mg/m³ 15 minute(s). STEL: 500 ppm 15 minute(s). TWA: 1600 mg/m³ 8 hour(s). TWA: 400 ppm 8 hour(s).</p>
Toluene	<p>ACGIH TLV (United States, 2/2010). TWA: 20 ppm 8 hour(s). NIOSH REL (United States, 6/2009). STEL: 560 mg/m³ 15 minute(s). STEL: 150 ppm 15 minute(s). TWA: 375 mg/m³ 10 hour(s). TWA: 100 ppm 10 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 560 mg/m³ 15 minute(s). STEL: 150 ppm 15 minute(s). TWA: 375 mg/m³ 8 hour(s). TWA: 100 ppm 8 hour(s). OSHA PEL Z2 (United States, 11/2006). AMP: 500 ppm 10 minute(s). CEIL: 300 ppm TWA: 200 ppm 8 hour(s).</p>
Octane	<p>OSHA PEL 1989 (United States, 3/1989). TWA: 300 ppm 8 hour(s). TWA: 1450 mg/m³ 8 hour(s). STEL: 375 ppm 15 minute(s). STEL: 1800 mg/m³ 15 minute(s). NIOSH REL (United States, 6/2009). TWA: 75 ppm 10 hour(s). TWA: 350 mg/m³ 10 hour(s). CEIL: 385 ppm 15 minute(s). CEIL: 1800 mg/m³ 15 minute(s). ACGIH TLV (United States, 2/2010). TWA: 300 ppm 8 hour(s). OSHA PEL (United States, 6/2010). TWA: 500 ppm 8 hour(s). TWA: 2350 mg/m³ 8 hour(s).</p>
Benzene	<p>ACGIH TLV (United States, 2/2010). Absorbed through skin. STEL: 8 mg/m³ 15 minute(s). STEL: 2.5 ppm 15 minute(s). TWA: 1.6 mg/m³ 8 hour(s). TWA: 0.5 ppm 8 hour(s). NIOSH REL (United States, 6/2009). STEL: 1 ppm 15 minute(s). TWA: 0.1 ppm 10 hour(s). OSHA PEL (United States, 6/2010). STEL: 5 ppm 15 minute(s). TWA: 1 ppm 8 hour(s). OSHA PEL 1989 (United States, 3/1989). STEL: 5 ppm 15 minute(s). TWA: 1 ppm 8 hour(s). OSHA PEL Z2 (United States, 11/2006). AMP: 50 ppm 10 minute(s). CEIL: 25 ppm TWA: 10 ppm 8 hour(s).</p>

Consult local authorities for acceptable exposure limits.

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

Section 9. Physical and chemical properties

- Melting/freezing point** : -102.7°C (-152.9°F) This is based on data for the following ingredient: Propyne.
Weighted average: -183.64°C (-298.6°F)
- Critical temperature** : Lowest known value: -146.9°C (-232.4°F) (Nitrogen).
- Vapor density** : Highest known value: 2.1 (Air = 1) (Butane). Weighted average: 1.29 (Air = 1)
- Gas Density (lb/ft³)** : Weighted average: 0.04

Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
- Incompatibility with various substances** : Extremely reactive or incompatible with the following materials: oxidizing materials.
Highly reactive or incompatible with the following materials: metals, acids and alkalis.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.

Section 11. Toxicological information

Toxicity data

Product/ingredient name	Result	Species	Dose	Exposure
Propane	LC50 Inhalation Gas.	Rat	>800000 ppm	15 minutes
Isobutane	LC50 Inhalation Vapor	Rat	658000 mg/m3	4 hours
	LC50 Inhalation Gas.	Rat	57 pph	15 minutes
	LC50 Inhalation Gas.	Rat	570000 ppm	15 minutes
Carbon dioxide	LC50 Inhalation Gas.	Rat	470000 ppm	30 minutes
Butane	LC50 Inhalation Vapor	Rat	658000 mg/m3	4 hours
2-methylpropene	LC50 Inhalation Vapor	Rat	550000 mg/m3	4 hours
Carbon monoxide	TDLo Intraperitoneal	Rat	35 mL/kg	-
	LC50 Inhalation Vapor	Rat	13500 mg/m3	15 minutes
	LC50 Inhalation Vapor	Rat	1900 mg/m3	4 hours
	LC50 Inhalation Gas.	Rat	6600 ppm	30 minutes
	LC50 Inhalation Gas.	Rat	3760 ppm	1 hours
	LC50 Inhalation Gas.	Mouse	2444 ppm	4 hours
	LC50 Inhalation Gas.	Rat	1807 ppm	4 hours
1,3-Butadiene	LD50 Oral	Rat	5480 mg/kg	-
	LC50 Inhalation Vapor	Rat	285 g/m3	4 hours
	LC50 Inhalation Vapor	Rat	285000 mg/m3	4 hours
	LC50 Inhalation Gas.	Rat	128000 ppm	4 hours
Pentane	LD50 Oral	Rat	>2000 mg/kg	-
	LC50 Inhalation Vapor	Rat	364 g/m3	4 hours

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

Isopentane	LC50 Inhalation Vapor	Rat	280000 mg/m3	4 hours
hex-1-ene	LD Dermal	Rabbit	>10 g/kg	-
	LD Oral	Rat	>10 g/kg	-
	LC50 Inhalation Gas.	Rat	32000 ppm	4 hours
n-Hexane	LD50 Oral	Rat	29700 mg/kg	-
	LD50 Oral	Rat	15840 mg/kg	-
	LDLo Intraperitoneal	Rat	9100 mg/kg	-
	TDLo Oral	Rat	20000 mg/kg	-
	LC50 Inhalation Vapor	Rat	627000 mg/m3	3 minutes
	LC50 Inhalation Vapor	Rat	96000 ppm	1 hours
	LC50 Inhalation Gas.	Rat	48000 ppm	4 hours
n-Heptane	LC50 Inhalation Vapor	Rat	103 g/m3	4 hours
	LC50 Inhalation Vapor	Rat	50242 ppm	1 hours
	LC50 Inhalation Gas.	Rat	48000 ppm	4 hours
	LD50 Dermal	Rabbit	14100 uL/kg	-
Toluene	LD50 Intraperitoneal	Rat	1332 mg/kg	-
	LD50 Intravenous	Rat	1960 mg/kg	-
	LD50 Oral	Rat	636 mg/kg	-
	LD50 Unreported	Rat	6900 mg/kg	-
	LDLo Intraperitoneal	Rat	2.5 mL/kg	-
	TDLo Dermal	Rat	26.4 mg/kg	-
	TDLo Intraperitoneal	Rat	1 g/kg	-
	TDLo Intraperitoneal	Rat	900 mg/kg	-
	TDLo Intraperitoneal	Rat	750 mg/kg	-
	TDLo Intraperitoneal	Rat	600 mg/kg	-
	TDLo Oral	Rat	1200 mg/kg	-
	TDLo Oral	Rat	1000 mg/kg	-
	TDLo Oral	Rat	800 mg/kg	-
	TDLo Oral	Rat	650 mg/kg	-
	TDLo Oral	Rat	400 mg/kg	-
	LC50 Inhalation Vapor	Rat	49 g/m3	4 hours
	Octane	LC50 Inhalation Vapor	Rat	28830 ppm
LC50 Inhalation Vapor		Rat	118 g/m3	4 hours
LC50 Inhalation Gas.		Rat	25260 ppm	4 hours
Benzene	LD50 Dermal	Rabbit	>9400 uL/kg	-
	LD50 Intraperitoneal	Rat	1100 ug/kg	-
	LD50 Oral	Rat	1 mL/kg	-
	LD50 Oral	Rat	6400 mg/kg	-
	LD50 Oral	Rat	1800 mg/kg	-
	LD50 Oral	Rat	930 mg/kg	-
	LDLo Subcutaneous	Rat	5 mg/kg	-
	TDLo Dermal	Rat	0.92 mL/kg	-
	TDLo Dermal	Rat	0.08 mL/kg	-
	TDLo Oral	Rat	1280 mg/kg	-
	TDLo Oral	Rat	320 mg/kg	-
	LC50 Inhalation Gas.	Rat	10000 ppm	7 hours
	LC50 Inhalation Gas.	Rat	10000 ppm	7 hours

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

Chronic effects on humans : **CARCINOGENIC EFFECTS:** Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Propene]. Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Ethylene]. Classified A4 (Not classifiable for humans or animals.) by ACGIH [2-methylpropene]. Classified 1 (Proven for humans.) by IARC, 1 (Known to be human carcinogens.) by NTP, + (Proven.) by NIOSH [1,3-Butadiene]. Classified A2 (Suspected for humans.) by ACGIH [1,3-Butadiene]. Classified A4 (Not classifiable for humans or animals.) by ACGIH, 3 (Not classifiable for humans.) by IARC [Toluene]. Classified A1 (Confirmed for humans.) by ACGIH, 1 (Proven for humans.) by IARC, 1 (Known to be human carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for humans.) by European Union [Benzene].
MUTAGENIC EFFECTS: Classified 2 by European Union [Benzene].
 Contains material which causes damage to the following organs: upper respiratory tract, skin.
 Contains material which may cause damage to the following organs: blood, kidneys, lungs, the nervous system, the reproductive system, liver, mucous membranes, heart, peripheral nervous system, cardiovascular system, bone marrow, central nervous system (CNS), eye, lens or cornea, muscle tissue.

Other toxic effects on humans : No specific information is available in our database regarding the other toxic effects of this material to humans.

Specific effects

- Carcinogenic effects** : Contains material which can cause cancer. Risk of cancer depends on duration and level of exposure.
- Mutagenic effects** : No known significant effects or critical hazards.
- Reproduction toxicity** : No known significant effects or critical hazards.

Section 12. Ecological information

Aquatic ecotoxicity

Product/ingredient name	Test	Result	Species	Exposure
hex-1-ene	-	Chronic NOEC 32 mg/L Fresh water	Daphnia - Water flea - Daphnia magna - <24 hours	48 hours
	-	Chronic NOEC 10 mg/L Fresh water	Fish - Zebra danio - Danio rerio - Young - 4 to 6 weeks - 3 cm	96 hours
	-	Chronic NOEC 10 mg/L Fresh water	Daphnia - Water flea - Daphnia magna - <24 hours	48 hours
n-Hexane	-	Acute LC50 113000 ug/L Fresh water	Fish - Mozambique tilapia - Tilapia mossambica - 99 mm - 10 g	96 hours
	-	Acute LC50 2500 to 2980 ug/L Fresh water	Fish - Fathead minnow - Pimephales promelas - 31 days - 20.4 mm - 0.123 g	96 hours
n-Heptane	-	Acute LC50 4924000 ug/L Fresh water	Fish - Western mosquitofish - Gambusia affinis - Adult	96 hours
	-	Acute LC50 375000 ug/L Fresh water	Fish - Mozambique	96 hours

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

			tilapia - Tilapia mossambica - 99 mm - 10 g	
Toluene	-	Acute EC50 19600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Larvae	48 hours
	-	Acute EC50 12500 ug/L Fresh water	Algae - Green algae - Pseudokirchneriella subcapitata	72 hours
	-	Acute EC50 6880 to 9830 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
	-	Acute EC50 6780 to 7810 ug/L Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss - Juvenile (Fledgling, Hatchling, Weanling) - 54 mm - 2.187 g	96 hours
	-	Acute EC50 6560 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
	-	Acute EC50 6000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
	-	Acute LC50 15.5 ppm Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio - Adult	48 hours
	-	Acute LC50 310000 to 420000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - <=24 hours	48 hours
	-	Acute LC50 170000 ug/L Marine water	Crustaceans - Dungeness or edible crab - Cancer magister - Zoea	48 hours
	-	Acute LC50 97700 to 174700 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
	-	Acute LC50 86300 to 174700 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
	-	Acute LC50 15500 ug/L Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
	-	Acute LC50 9360 ug/L	Fish - Coho	96 hours

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

		Fresh water	salmon,silver salmon - Oncorhynchus kisutch - Fry - >90 days	
-		Acute LC50 8110 ug/L Fresh water	Fish - Coho salmon,silver salmon - Oncorhynchus kisutch - 0.3 g	96 hours
-		Acute LC50 8090 to 8780 ug/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha - Fry - 3.5 cm - 0.35 g	96 hours
-		Acute LC50 7630 to 8480 ug/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha - Fry - 3.5 cm - 0.35 g	96 hours
-		Acute LC50 6780 to 7810 ug/L Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss - Juvenile (Fledgling, Hatchling, Weanling) - 54 mm - 2.187 g	96 hours
-		Acute LC50 6410 to 7180 ug/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha - Fry - 3.5 cm - 0.35 g	96 hours
-		Acute LC50 5800 ug/L Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
-		Acute LC50 5500 ug/L Fresh water	Fish - Coho salmon,silver salmon - Oncorhynchus kisutch - Fry - 1 g	96 hours
-		Acute LC50 7.3 ul/L Marine water	Fish - Striped bass - Morone saxatilis - Juvenile (Fledgling, Hatchling, Weanling) - 6 g	96 hours
-		Chronic NOEC 28000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - <=24 hours	48 hours
Benzene	-	Acute EC50 1600000 ug/L Fresh water	Algae - Green algae - Selenastrum sp.	96 hours
	-	Acute EC50 >1360000 ug/L Fresh water	Algae - Green algae - Scenedesmus	96 hours

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

-	Acute EC50 1000000 to 1800000 ug/L Fresh water	abundans Algae - Green algae - Selenastrum sp.	72 hours
-	Acute EC50 98800 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp. - Nauplii	48 hours
-	Acute EC50 58400 to 82300 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp. - Nauplii	48 hours
-	Acute EC50 29000 ug/L Fresh water	Algae - Green algae - Pseudokirchneriella subcapitata	72 hours
-	Acute EC50 22000 to 29500 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
-	Acute EC50 11730 to 15600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
-	Acute EC50 10000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Juvenile (Fledgling, Hatchling, Weanling)	48 hours
-	Acute EC50 9230 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
-	Acute LC50 9.2 to 11.7 mg/L Fresh water	Fish - Rainbow trout, donaldson trout - Oncorhynchus mykiss - 2.4 g	96 hours
-	Acute LC50 35 to 43.8 ppm Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio - Adult	48 hours
-	Acute LC50 >347000 ug/L Marine water	Crustaceans - Dungeness or edible crab - Cancer magister - Zoea	48 hours
-	Acute LC50 139000 to 187000 ug/L Fresh water	Crustaceans - Brine shrimp - Artemia sp. - Nauplii	48 hours
-	Acute LC50 120000 ug/L Fresh water	Crustaceans - Aquatic sowbug - Asellus aquaticus	48 hours
-	Acute LC50 99200 to 122600 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
-	Acute LC50 97800 to	Crustaceans -	48 hours

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

	124000 ug/L Fresh water	Brine shrimp - Artemia sp. - Nauplii	
-	Acute LC50 96200 to 134100 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
-	Acute LC50 76900 to 114100 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
-	Acute LC50 59600 to 80700 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - Neonate - <=24 hours	48 hours
-	Acute LC50 35000 ug/L Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
-	Acute LC50 33000 ug/L Marine water	Crustaceans - Daggerblade grass shrimp - Palaemonetes pugio	48 hours
-	Acute LC50 21000 ug/L Marine water	Crustaceans - Brine shrimp - Artemia salina - Nauplii	48 hours
-	Acute LC50 5900 ug/L Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss	96 hours
-	Acute LC50 5300 ug/L Fresh water	Fish - Rainbow trout,donaldson trout - Oncorhynchus mykiss - Juvenile (Fledgling, Hatchling, Weanling) - 106 mm - 13.9 g	96 hours
-	Acute LC50 10.9 ul/L Marine water	Fish - Striped bass - Morone saxatilis - Juvenile (Fledgling, Hatchling, Weanling) - 52 mm - 1.5 g	96 hours
-	Acute LC50 10.76 to 12.04 ul/L Fresh water	Fish - Sockeye salmon - Oncorhynchus nerka - Smolt - 2 years - 75 mm	96 hours
-	Acute LC50 9.8 ul/L Fresh water	Fish - Coho salmon,silver salmon - Oncorhynchus kisutch - Fry	96 hours

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene



-	Acute LC50 8.47 to 9.09 ul/L Marine water	Fish - Pink salmon - Oncorhynchus gorbuscha - Fry	96 hours
-	Acute LC50 5.8 ul/L Marine water	Fish - Striped bass - Morone saxatilis - Juvenile (Fledgling, Hatchling, Weanling) - 6 g	96 hours
-	Acute LC50 5.55 to 8.21 ul/L Marine water	Fish - Sockeye salmon - Oncorhynchus nerka - Smolt - 2 years - 75 mm	96 hours
-	Acute LC50 5.28 ul/L Fresh water	Fish - Pink salmon - Oncorhynchus gorbuscha - Fry	96 hours
-	Chronic NOEC <13000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna - <=24 hours	48 hours

- Products of degradation** : Products of degradation: carbon oxides (CO, CO₂) and water, nitrogen oxides (NO, NO₂ etc.).
- Environmental fate** : Not available.
- Environmental hazards** : No known significant effects or critical hazards.
- Toxicity to the environment** : Not available.


Section 13. Disposal considerations

Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, local regulation. Return cylinders with residual product to Airgas, Inc. Do not dispose of locally.

Section 14. Transport information

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.	2.1	Not applicable (gas).		-
TDG Classification	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.	2.1	Not applicable (gas).		<p>Explosive Limit and Limited Quantity Index 0.125</p> <p>ERAP Index 3000</p> <p>Passenger Carrying Ship Index Forbidden</p> <p>Passenger</p>

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

						Carrying Road or Rail Index Forbidden
Mexico Classification	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.	2.1	Not applicable (gas).		-

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

Section 15. Regulatory information

United States

U.S. Federal regulations

TSCA 4(a) final test rules: Pentane; n-Heptane

TSCA 8(a) PAIR: Pentane; n-Heptane

TSCA 8(a) IUR: Partial exemption

United States inventory (TSCA 8b): All components are listed or exempted.

TSCA 12(b) annual export notification: Pentane; n-Heptane

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: Nitrogen; Propane; Methane; Isobutane; Butane; Ethane; Propene; Carbon dioxide; 1,3-Butadiene; Pentane; Propyne; Ethylene; allene; Isopentane; 2-methylpropene; Carbon monoxide; Argon; Ethyne; hex-1-ene; n-Hexane; n-Heptane; Toluene; Octane; Benzene

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

Nitrogen: Sudden release of pressure; Propane: Fire hazard, Sudden release of pressure; Methane: Fire hazard, Sudden release of pressure; Isobutane: Fire hazard, Sudden release of pressure; Butane: Fire hazard, Sudden release of pressure; Ethane: Fire hazard, Sudden release of pressure, Immediate (acute) health hazard; Propene: Fire hazard, Sudden release of pressure; Carbon dioxide: Sudden release of pressure, Immediate (acute) health hazard, Delayed (chronic) health hazard; 1,3-Butadiene: Fire hazard, reactive, Sudden release of pressure, Immediate (acute) health hazard, Delayed (chronic) health hazard; Pentane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Propyne: Fire hazard, reactive; Ethylene: Fire hazard, reactive, Sudden release of pressure, Delayed (chronic) health hazard; allene: Fire hazard, Sudden release of pressure; Isopentane: Fire hazard; 2-methylpropene: Fire hazard, Sudden release of pressure; Carbon monoxide: Fire hazard, Sudden release of pressure, Immediate (acute) health hazard, Delayed (chronic) health hazard; Argon: Sudden release of pressure; Ethyne: Fire hazard, reactive, Sudden release of pressure, Immediate (acute) health hazard; hex-1-ene: Fire hazard, Immediate (acute) health hazard; n-Hexane: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; n-Heptane: Fire hazard; Toluene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard; Octane: Fire hazard; Benzene: Fire hazard, Immediate (acute) health hazard, Delayed (chronic) health hazard

Clean Water Act (CWA) 307: Toluene; Benzene

Clean Water Act (CWA) 311: Toluene; Benzene

Clean Air Act (CAA) 112 accidental release prevention - Flammable Substances:

Propane
Methane
Isobutane
Propylene
Ethane
N-Butane
Trans-2-Butene
Acetylene
Isobutylene

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

1,2-Propadiene (Allene)
 1-Butene
 Cis-2-Butene
 Ethylene
 Methyl Acetylene
 1,3-Butadiene
 N-Pentane
 Isopentane

Clean Air Act (CAA) 112 regulated flammable substances: Propane; Methane; Isobutane; Propene; Ethane; Butane; (E)-but-2-ene; Ethyne; 2-methylpropene; allene; but-1-ene; (Z)-but-2-ene; Ethylene; Propyne; 1,3-Butadiene; Pentane; Isopentane

SARA 313

Form R - Reporting requirements

<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
Propylene	115-07-1	1 - 10
Ethylene	74-85-1	1 - 5
1,3-Butadiene	106-99-0	0.0002 - 4
N-Hexane	110-54-3	0.005 - 1
Toluene	108-88-3	0.005 - 1
Benzene	71-43-2	0.00005 - 1

Supplier notification

Propylene	115-07-1	1 - 10
Ethylene	74-85-1	1 - 5
1,3-Butadiene	106-99-0	0.0002 - 4
N-Hexane	110-54-3	0.005 - 1
Toluene	108-88-3	0.005 - 1
Benzene	71-43-2	0.00005 - 1

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

State regulations

Connecticut Carcinogen Reporting: None of the components are listed.
Connecticut Hazardous Material Survey: None of the components are listed.
Florida substances: None of the components are listed.
Illinois Chemical Safety Act: None of the components are listed.
Illinois Toxic Substances Disclosure to Employee Act: None of the components are listed.
Louisiana Reporting: None of the components are listed.
Louisiana Spill: None of the components are listed.
Massachusetts Spill: None of the components are listed.
Massachusetts Substances: The following components are listed: NITROGEN; PROPANE; METHANE; ISOBUTANE; ARGON; CARBON DIOXIDE; PROPYLENE (PROPENE); ETHANE; BUTANE; 2-BUTENE-TRANS; ACETYLENE; CARBON MONOXIDE; 2-METHYLPROPENE; 1-BUTENE; 2-BUTENE-CIS; ETHYLENE; PROPYNE; 1,3-BUTADIENE; PENTANE; ISOPENTANE; 1-HEXENE; HEXANE; HEPTANE (N-HEPTANE); TOLUENE; OCTANE; BENZENE
Michigan Critical Material: None of the components are listed.
Minnesota Hazardous Substances: None of the components are listed.
New Jersey Hazardous Substances: The following components are listed: NITROGEN; PROPANE; METHANE; Isobutane; PROPANE, 2-METHYL-; ARGON; CARBON DIOXIDE; CARBONIC ACID GAS; PROPYLENE; 1-PROPENE; ETHANE; BUTANE; 2-BUTENE-trans; 2-BUTENE, (2E)-; ACETYLENE; ETHYNE; CARBON MONOXIDE; ISOBUTYLENE; 1-PROPENE, 2-METHYL-; PROPADIENE; 1,2-PROPADIENE; 1-BUTENE; 2-BUTENE-cis; 2-BUTENE, (2Z)-; ETHYLENE; ETHENE; METHYL ACETYLENE; 1-PROPYNE; 1,3-BUTADIENE; BIETHYLENE; PENTANE; ISOPENTANE; BUTANE, 2-METHYL-; 1-HEXENE; n-HEXANE; HEXANE; n-HEPTANE; HEPTANE; TOLUENE; BENZENE, METHYL-; OCTANE; BENZENE
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: The following components are listed: carbon monoxide
New York Acutely Hazardous Substances: The following components are listed: Hexane; Toluene; Benzene

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

New York Toxic Chemical Release Reporting: None of the components are listed.

Pennsylvania RTK Hazardous Substances: The following components are listed: NITROGEN; PROPANE; METHANE; PROPANE, 2-METHYL-; ARGON; CARBON DIOXIDE; 1-PROPENE; ETHANE; BUTANE; 2-BUTENE, (E)-; ETHYNE; CARBON MONOXIDE; 1-PROPENE, 2-METHYL-; 1-BUTENE; 2-BUTENE, (Z)-; ETHENE; 1-PROPYNE; 1,3-BUTADIENE; PENTANE; BUTANE, 2-METHYL-; 1-HEXENE; HEXANE; HEPTANE; BENZENE, METHYL-; OCTANE; BENZENE

Rhode Island Hazardous Substances: None of the components are listed.

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

Carbon Monoxide
1,3-Butadiene
Toluene

No.
Yes.
No.

Yes.
Yes.
Yes.

No.
Yes.
No.

No.
No.
7000 µg/day (ingestion)

Benzene

Yes.
Yes.

6.4 µg/day (ingestion)
13 µg/day (inhalation)

24 µg/day (ingestion)
49 µg/day (inhalation)

Canada

WHMIS (Canada)

: Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
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; Carbon dioxide; Volatile organic compounds; Benzene

Canadian ARET: None of the components are listed.

Canadian NPRI: The following components are listed: Propane; Volatile organic compounds; Butane; Propylene; Volatile organic compounds; Butane; Butene; Acetylene; Carbon monoxide; Butene; Butene; Ethylene; 1,3-Butadiene; Pentane; Pentane; Hexene; n-Hexane; Heptane; Toluene; Octane; Benzene

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

United States

Label requirements

: FLAMMABLE GAS.
MAY CAUSE FLASH FIRE.
HARMFUL IF INHALED OR SWALLOWED.
CAUSES RESPIRATORY TRACT IRRITATION.
MAY CAUSE SKIN IRRITATION.
CONTAINS MATERIAL THAT CAN CAUSE TARGET ORGAN DAMAGE.
CANCER HAZARD - CONTAINS MATERIAL WHICH CAN CAUSE CANCER.
CAUSES SEVERE EYE IRRITATION.
CONTENTS UNDER PRESSURE.

Canada

Label requirements

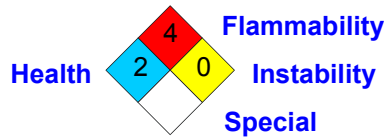
: Class A: Compressed gas.
Class B-1: Flammable gas.
Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Argon / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Octane / N Pentane / Nitrogen / Propane / Propadiene / Propylene / Toluene / Trans-2-Butene

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

Health	2
Flammability	4
Physical hazards	0

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



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.