

Material Safety Data Sheet



Flammable Gas Mixture: 1 Butene / 1 Hexene / 1,3 Butadiene / Acetylene / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Pentane / Nitrogen / Octane / Propadiene / Propane / 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 / Benzene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Ethane / Ethylene / Heptane / Hexane / Isobutane / Isobutylene / Isopentane / Methane / Methyl Acetylene / N Butane / N Pentane / Nitrogen / Octane / Propadiene / Propane / 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#** : 007498
- Date of Preparation/Revision** : **9/6/2007.**
- In case of emergency** : 1-866-734-3438

Section 2. Hazards identification

- Physical state** : Gas.
- Emergency overview** : Warning!
CANCER HAZARD
CONTAINS MATERIAL WHICH CAN CAUSE CANCER
FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
HARMFUL IF INHALED.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
BLOOD, KIDNEYS, LUNGS, NERVOUS SYSTEM, REPRODUCTIVE SYSTEM, LIVER,
MUCOUS MEMBRANES, HEART, PERIPHERAL NERVOUS SYSTEM,
CARDIOVASCULAR SYSTEM, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS
SYSTEM, EYE, LENS OR CORNEA, MUSCLE TISSUE.
VAPOR MAY CAUSE FLASH FIRE.
MAY BE HARMFUL IF SWALLOWED.
MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
Do not ingest. Avoid contact with skin and clothing. Avoid breathing gas. Keep away from heat, sparks and flame. Do not puncture or incinerate container. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.
Contact with rapidly expanding gases can cause frostbite.
- Routes of entry** : Inhalation,Dermal,Eyes
- Potential acute health effects**
- Eyes** : Moderately irritating to the eyes.
- Skin** : Moderately irritating to the skin.
- Inhalation** : Toxic by inhalation. Moderately irritating to the respiratory system.
- Ingestion** : Ingestion is not a normal route of exposure for gases

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Potential chronic health effects : **CARCINOGENIC EFFECTS** Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [propylene]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [ethylene]. Classified 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by NIOSH, 1 (Proven for human.) by European Union [1,3-butadiene]. Classified A2 (Suspected for human.) by ACGIH, 2A (Probable for human.) by IARC [1,3-butadiene]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [toluene]. Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for human.) by European Union [benzene].
MUTAGENIC EFFECTS Classified 2 by European Union [1,3-butadiene].
TERATOGENIC EFFECTS: Not available.

Medical conditions aggravated by overexposure : Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs.

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 - 89	ACGIH TLV (United States, 1/2006). Notes: ACGIH 2004 Adoption TWA: 1000 ppm 65534 times per shift, 8 hour(s). NIOSH REL (United States, 12/2001). TWA: 1800 mg/m ³ 65534 times per shift, 10 hour(s). TWA: 1000 ppm 65534 times per shift, 10 hour(s). OSHA PEL (United States, 11/2006). TWA: 1800 mg/m ³ 65534 times per shift, 8 hour(s). TWA: 1000 ppm 65534 times per shift, 8 hour(s).
Propane	74-98-6	6 - 20	
Methane	74-82-8	1 - 20	ACGIH TLV (United States, 1/2006). Notes: ACGIH 2004 Adoption TWA: 1000 ppm 65534 times per shift, 8 hour(s).
Ethane	74-84-0	1 - 20	ACGIH TLV (United States, 1/2006). Notes: ACGIH 2004 Adoption TWA: 1000 ppm 65534 times per shift, 8 hour(s).
Propylene	115-07-1	1 - 10	ACGIH TLV (United States, 1/2005). TWA: 500 ppm 8 hour(s). Form: All forms TWA: 500 ppm 65534 times per shift, 8 hour(s).
Carbon Dioxide	124-38-9	0.0001 - 10	ACGIH TLV (United States, 1/2006). STEL: 54000 mg/m ³ 65534 times per shift, 15 minute(s). STEL: 30000 ppm 65534 times per shift, 15 minute(s). TWA: 9000 mg/m ³ 65534 times per shift, 8 hour(s). TWA: 5000 ppm 65534 times per shift, 8 hour(s). NIOSH REL (United States, 12/2001). STEL: 54000 mg/m ³ 65534 times per shift, 15 minute(s). STEL: 30000 ppm 65534 times per shift, 15 minute(s).

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			TWA: 9000 mg/m ³ 65534 times per shift, 10 hour(s).
			TWA: 5000 ppm 65534 times per shift, 10 hour(s).
			OSHA PEL (United States, 11/2006).
			TWA: 9000 mg/m ³ 65534 times per shift, 8 hour(s).
			TWA: 5000 ppm 65534 times per shift, 8 hour(s).
Ethylene	74-85-1	0.02 - 10	ACGIH TLV (United States, 1/2006). Notes: Refers to Appendix A -- Carcinogens. ACGIH 2005 Adoption
			TWA: 200 ppm 65534 times per shift, 8 hour(s).
Pentane	109-66-0	0.0001 - 5	ACGIH TLV (United States, 1/2006). Notes: 1998 Adoption.
			TWA: 600 ppm 65534 times per shift, 8 hour(s).
			NIOSH REL (United States, 12/2001).
			CEIL: 1800 mg/m ³ 65534 times per shift, 15 minute(s).
			CEIL: 610 ppm 65534 times per shift, 15 minute(s).
			TWA: 350 mg/m ³ 65534 times per shift, 10 hour(s).
			TWA: 120 ppm 65534 times per shift, 10 hour(s).
			OSHA PEL (United States, 11/2006).
			TWA: 2950 mg/m ³ 65534 times per shift, 8 hour(s).
			TWA: 1000 ppm 65534 times per shift, 8 hour(s).
Isopentane	78-78-4	0.0001 - 5	ACGIH TLV (United States, 1/2006). Notes: 1998 Adoption.
			TWA: 600 ppm 65534 times per shift, 8 hour(s).
Carbon Monoxide	630-08-0	0.0001 - 5	ACGIH TLV (United States, 1/2006). Notes: Substances for which there is a Biological Exposure Index or Indices
			TWA: 29 mg/m ³ 65534 times per shift, 8 hour(s).
			TWA: 25 ppm 65534 times per shift, 8 hour(s).
			NIOSH REL (United States, 12/2001).
			CEIL: 229 mg/m ³
			CEIL: 200 ppm
			TWA: 40 mg/m ³ 65534 times per shift, 10 hour(s).
			TWA: 35 ppm 65534 times per shift, 10 hour(s).
			OSHA PEL (United States, 11/2006).
			TWA: 55 mg/m ³ 65534 times per shift, 8 hour(s).
			TWA: 50 ppm 65534 times per shift, 8 hour(s).
trans-2-butene	624-64-6	1 - 5	
Argon	7440-37-1	0.0001 - 5	
cis-2-Butene	590-18-1	0.0001 - 5	
1,3-Butadiene	106-99-0	0.0001 - 5	ACGIH TLV (United States, 1/2006). Notes: Substance identified by other sources as a

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			<p>suspected or confirmed human carcinogen. 1994-1995 Adoption</p> <p>Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124):36338-33351, June 30, 1993, for revised OSHA PEL. Refers to Appendix A -- Carcinogens.</p> <p>TWA: 4.4 mg/m³ 65534 times per shift, 8 hour(s).</p> <p>TWA: 2 ppm 65534 times per shift, 8 hour(s).</p> <p>OSHA PEL (United States, 11/2006).</p> <p>STEL: 5 ppm 65534 times per shift, 15 minute(s).</p> <p>TWA: 1 ppm 65534 times per shift, 8 hour(s).</p>
Isobutane	75-28-5	0.0001 - 5	<p>ACGIH TLV (United States, 1/2006). Notes: ACGIH 2004 Adoption</p> <p>TWA: 1000 ppm 65534 times per shift, 8 hour(s).</p> <p>NIOSH REL (United States, 12/2001).</p> <p>TWA: 1900 mg/m³ 65534 times per shift, 10 hour(s).</p> <p>TWA: 800 ppm 65534 times per shift, 10 hour(s).</p>
n-Butane	106-97-8	0.0001 - 5	<p>ACGIH TLV (United States, 1/2006). Notes: ACGIH 2004 Adoption</p> <p>TWA: 1000 ppm 65534 times per shift, 8 hour(s).</p> <p>NIOSH REL (United States, 12/2001).</p> <p>TWA: 1900 mg/m³ 65534 times per shift, 10 hour(s).</p> <p>TWA: 800 ppm 65534 times per shift, 10 hour(s).</p>
Methyl Acetylene	74-99-7	1 - 5	<p>ACGIH TLV (United States, 1/2006).</p> <p>TWA: 1640 mg/m³ 65534 times per shift, 8 hour(s).</p> <p>TWA: 1000 ppm 65534 times per shift, 8 hour(s).</p> <p>NIOSH REL (United States, 12/2001).</p> <p>TWA: 1650 mg/m³ 65534 times per shift, 10 hour(s).</p> <p>TWA: 1000 ppm 65534 times per shift, 10 hour(s).</p> <p>OSHA PEL (United States, 11/2006).</p> <p>TWA: 1650 mg/m³ 65534 times per shift, 8 hour(s).</p> <p>TWA: 1000 ppm 65534 times per shift, 8 hour(s).</p>
Propadiene (Allene)	463-49-0	0.0001 - 5	<p>Nationale MAC-lijst (Netherlands, 7/2006). Notes: Administrative</p> <p>TGG: 500 mg/m³ 65534 times per shift, 8 hour(s).</p>
Acetylene	74-86-2	0.1 - 3	<p>NIOSH REL (United States, 12/2001).</p> <p>CEIL: 2662 mg/m³</p> <p>CEIL: 2500 ppm</p>
n-Heptane	142-82-5	0.0001 - 1	<p>ACGIH TLV (United States, 1/2006).</p> <p>STEL: 2050 mg/m³ 65534 times per shift, 15</p>

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			<p>minute(s). STEL: 500 ppm 65534 times per shift, 15 minute(s). TWA: 1640 mg/m³ 65534 times per shift, 8 hour(s). TWA: 400 ppm 65534 times per shift, 8 hour(s). NIOSH REL (United States, 12/2001). CEIL: 1800 mg/m³ 65534 times per shift, 15 minute(s). CEIL: 440 ppm 65534 times per shift, 15 minute(s). TWA: 350 mg/m³ 65534 times per shift, 10 hour(s). TWA: 85 ppm 65534 times per shift, 10 hour(s). OSHA PEL (United States, 11/2006). TWA: 2000 mg/m³ 65534 times per shift, 8 hour(s). TWA: 500 ppm 65534 times per shift, 8 hour(s). Del Lietuvos Higienos Normos (Lithuania, 12/2001). TWA: 100 mg/m³ 65534 times per shift, 8 hour(s).</p>
Isobutylene	115-11-7	0.0001 - 1	
1-Butene	106-98-9	0.0001 - 1	
1-Hexene	592-41-6	0.0001 - 1	
Hexane	110-54-3	0.0001 - 1	<p>ACGIH TLV (United States, 1/2006). Notes: 2002 Adoption. TWA: 50 ppm 65534 times per shift, 8 hour(s). ACGIH TLV (United States, 1/2006). Skin Notes: Substances for which there is a Biological Exposure Index or Indices 1998 Adoption. TWA: 50 ppm 65534 times per shift, 8 hour(s). NIOSH REL (United States, 12/2001). TWA: 180 mg/m³ 65534 times per shift, 10 hour(s). TWA: 50 ppm 65534 times per shift, 10 hour(s). OSHA PEL (United States, 11/2006). TWA: 1800 mg/m³ 65534 times per shift, 8 hour(s). TWA: 500 ppm 65534 times per shift, 8 hour(s). ACGIH TLV (United States, 1/2006). Skin Notes: 1996 Adoption Refers to Appendix A -- Carcinogens. TWA: 188 mg/m³ 65534 times per shift, 8 hour(s). TWA: 50 ppm 65534 times per shift, 8 hour(s). NIOSH REL (United States, 12/2001). STEL: 560 mg/m³ 65534 times per shift, 15 minute(s). STEL: 150 ppm 65534 times per shift, 15 minute(s). TWA: 375 mg/m³ 65534 times per shift, 10 hour(s).</p>
Toluene	108-88-3	0.0001 - 1	

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			<p>TWA: 100 ppm 65534 times per shift, 10 hour(s).</p> <p>OSHA PEL Z2 (United States, 11/2006). AMP: 500 ppm 65534 times per shift, 10 minute(s). CEIL: 300 ppm TWA: 200 ppm 65534 times per shift, 8 hour(s).</p>
Octane	111-65-9	0.0001 - 1	<p>ACGIH TLV (United States, 1/2006). Notes: 1999 Adoption. TWA: 300 ppm 65534 times per shift, 8 hour(s).</p> <p>NIOSH REL (United States, 12/2001). CEIL: 1800 mg/m³ 65534 times per shift, 15 minute(s). CEIL: 385 ppm 65534 times per shift, 15 minute(s). TWA: 350 mg/m³ 65534 times per shift, 10 hour(s). TWA: 75 ppm 65534 times per shift, 10 hour(s).</p> <p>OSHA PEL (United States, 11/2006). TWA: 2350 mg/m³ 65534 times per shift, 8 hour(s). TWA: 500 ppm 65534 times per shift, 8 hour(s).</p>
Benzene	71-43-2	0.00005 - 0.9	<p>ACGIH TLV (United States, 1/2006). Skin STEL: 8 mg/m³ 65534 times per shift, 15 minute(s). STEL: 2.5 ppm 65534 times per shift, 15 minute(s). TWA: 1.6 mg/m³ 65534 times per shift, 8 hour(s). TWA: 0.5 ppm 65534 times per shift, 8 hour(s).</p> <p>NIOSH REL (United States, 12/2001). Notes: See Appendix A - NIOSH Potential Occupational Carcinogen STEL: 1 ppm 65534 times per shift, 15 minute(s). TWA: 0.1 ppm 65534 times per shift, 10 hour(s).</p> <p>OSHA PEL (United States, 11/2006). STEL: 5 ppm 65534 times per shift, 15 minute(s). TWA: 1 ppm 65534 times per shift, 8 hour(s).</p> <p>OSHA PEL Z2 (United States, 11/2006). AMP: 50 ppm 65534 times per shift, 10 minute(s). CEIL: 25 ppm TWA: 10 ppm 65534 times per shift, 8 hour(s).</p>

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Section 4. First aid measures

No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.

- Eye contact** : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.
- Frostbite** : Try to warm up the frozen tissues and seek medical attention.
- Inhalation** : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
- Ingestion** : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Section 5. Fire fighting measures

- Flammability of the product** : Flammable.
- Auto-ignition temperature** : The lowest known value is 286.85°C (548.3°F) (butane).
- Flash point** : The lowest known value is Closed cup: -188.15°C (-306.7°F). (methane)
- Flammable limits** : The greatest known range is Lower: 2.5% Upper: 82% (acetylene)
- Products of combustion** : These products are carbon oxides (CO, CO₂), nitrogen oxides (NO, NO₂...).
- Fire hazards in presence of various substances** : Extremely flammable in presence of open flames, sparks and static discharge, of oxidizing materials.
Flammable in presence of heat.
- Fire fighting media and instructions** : In case of fire, use water spray (fog), foam, dry chemicals, or CO₂.

If involved in fire, shut off flow immediately if it can be done without risk. Apply water from a safe distance to cool container and protect surrounding area.
Extremely flammable. Gas may accumulate in confined areas, travel considerable distance to 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 facepiece 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.

Section 7. Handling and storage

- Handling** : Do not ingest. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Keep away from heat, sparks and flame. To avoid fire, minimize ignition sources. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Do not puncture or incinerate container. Wash thoroughly after handling. High pressure gas. 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.

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Storage : Keep container tightly closed. Keep container in a cool, well-ventilated area. 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

Engineering controls : Use only with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. The engineering controls also need to keep gas, vapor or dust concentrations below any 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 or gauntlets 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 : Full chemical resistant suit and self-contained breathing apparatus only by trained and authorized persons.

Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Molecular weight : Not applicable.

Molecular formula : Not applicable.

Boiling/condensation point : Not available.

Melting/freezing point : -102.77°C (-153°F) based on data for: propyne. Weighted average: -184.23°C (-299.6°F)

Critical temperature : The lowest known value is -146.9°C (-232.4°F) (nitrogen).

Vapor density : The highest known value is 2 (Air = 1) (isobutane). Weighted average: 1.18 (Air = 1)

Specific Volume (ft³/lb) : Not applicable.

Gas Density (lb/ft³) : Weighted average: 0.02

Section 10. Stability and reactivity

Stability and reactivity : Unstable. (1,3-butadiene)

Conditions of instability : Under normal conditions of storage and use, hazardous polymerization will not occur. Unstable. (at high temperature) (1,3-butadiene)

Incompatibility with various substances : Extremely reactive or incompatible with oxidizing agents. Reactive with metals, acids, alkalis.

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Section 11. Toxicological information

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Pentane	LD50	>2000 mg/kg	Oral	Rat
Carbon Monoxide	LC50	3760 ppm (1 hour(s))	Inhalation	Rat
	LC50	2444 ppm (4 hour(s))	Inhalation	Mouse
1,3-Butadiene	LD50	5480 mg/kg	Oral	Rat
	LD50	3210 mg/kg	Oral	Mouse
n-Heptane	LC50	50242 ppm (1 hour(s))	Inhalation	Rat
Toluene	LD50	636 mg/kg	Oral	Rat
	LDLo	50 mg/kg	Oral	human
	LC50	28830 ppm (1 hour(s))	Inhalation	Rat
Benzene	LD50	930 mg/kg	Oral	Rat
	LD50	1800 mg/kg	Oral	Rat
	LD50	4700 mg/kg	Oral	Mouse
	LD50	48 mg/kg	Dermal	Mouse
	LDLo	50 mg/kg	Oral	man
	LC50	10000 ppm (7 hour(s))	Inhalation	Rat

Chronic effects on humans : **CARCINOGENIC EFFECTS** Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [propylene]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [ethylene]. Classified 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by NIOSH, 1 (Proven for human.) by European Union [1,3-butadiene]. Classified A2 (Suspected for human.) by ACGIH, 2A (Probable for human.) by IARC [1,3-butadiene]. Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [toluene]. Classified A1 (Confirmed for human.) by ACGIH, 1 (Proven for human.) by IARC, 1 (Known To Be Human Carcinogens.) by NTP, + (Proven.) by OSHA, + (Proven.) by NIOSH, 1 (Proven for human.) by European Union [benzene]. **MUTAGENIC EFFECTS** Classified 2 by European Union [1,3-butadiene]. Contains material which causes damage to the following organs: blood, kidneys, lungs, the nervous system, the reproductive system, liver, mucous membranes, heart, peripheral nervous system, cardiovascular system, upper respiratory tract, skin, 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 for 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

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>	
Hexane	Pimephales promelas (LC50)	96 hour(s)	2.5 mg/l	
	Toluene	Daphnia magna (EC50)	48 hour(s)	6 mg/l
		Daphnia magna (EC50)	48 hour(s)	6.56 mg/l
	Oncorhynchus mykiss (EC50)	48 hour(s)	6.78 mg/l	
	Oncorhynchus mykiss (LC50)	96 hour(s)	5.8 mg/l	
	Oncorhynchus mykiss (LC50)	96 hour(s)	6.78 mg/l	
	Pimephales promelas (LC50)	96 hour(s)	12.6 mg/l	
Benzene	Daphnia magna (EC50)	48 hour(s)	9.23 mg/l	
	Daphnia magna (EC50)	48 hour(s)	10 mg/l	

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Daphnia magna (EC50)	48 hour(s)	11.73 mg/l
Oncorhynchus mykiss (LC50)	96 hour(s)	5.3 mg/l
Oncorhynchus mykiss (LC50)	96 hour(s)	5.9 mg/l
Oncorhynchus mykiss (LC50)	96 hour(s)	9.2 mg/l

- Products of degradation** : These products are carbon oxides (CO, CO₂) and water, nitrogen oxides (NO, NO₂...).
- Toxicity of the products of biodegradation** : The products of degradation are less toxic than the product itself.
- 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><u>Explosive Limit and Limited Quantity Index</u> 0.125</p> <p><u>ERAP Index</u> 3000</p> <p><u>Passenger Carrying Ship Index</u> Forbidden</p> <p><u>Passenger Carrying Road or Rail Index</u> Forbidden</p>
Mexico Classification	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.	2.1	Not applicable (gas).		-

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

Section 15. Regulatory information

United States

U.S. Federal regulations : TSCA 4(a) final test rules: pentane; n-hexane; heptane
 TSCA 8(a) PAIR: pentane; heptane
 TSCA 8(b) inventory: but-1-ene; propadiene; pentane; isopentane; 2-methylpropene; carbon monoxide; argon; acetylene; hexene; n-hexane; toluene; octane; heptane; (Z)-but-2-ene; nitrogen; propane; methane; ethane; (E)-but-2-ene; propylene; carbon dioxide; 1,3-butadiene; isobutane; butane; propyne; ethylene; benzene
 TSCA 12(b) one time export: pentane; heptane
 TSCA 12(b) annual export notification: n-hexane
 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: propadiene; pentane; isopentane; 2-methylpropene; carbon monoxide; argon; acetylene; hexene; n-hexane; toluene; octane; heptane; nitrogen; propane; methane; ethane; propylene; carbon dioxide; 1,3-butadiene; isobutane; butane; propyne; ethylene
 SARA 311/312 MSDS distribution - chemical inventory - hazard identification:
 propadiene: Fire hazard, Sudden Release of Pressure; pentane: Fire hazard, Immediate (Acute) Health Hazard; 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; acetylene: Fire hazard, reactive, Sudden Release of Pressure, Immediate (Acute) Health Hazard; hexene: Fire hazard, Immediate (Acute) Health Hazard; n-hexane: Fire hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; toluene: Fire hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; octane: Fire hazard; heptane: Fire hazard; nitrogen: Sudden Release of Pressure; propane: Fire hazard, Sudden Release of Pressure; methane: Fire hazard, Sudden Release of Pressure; ethane: Fire hazard, Sudden Release of Pressure, Immediate (Acute) Health Hazard; propylene: 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; isobutane: Fire hazard, Sudden Release of Pressure; butane: Fire hazard, Sudden Release of Pressure; propyne: Fire hazard, reactive; ethylene: Fire hazard, reactive, Sudden Release of Pressure, 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: but-1-ene; propadiene; pentane; isopentane; 2-methylpropene; acetylene; (Z)-but-2-ene; propane; methane; ethane; (E)-but-2-ene; propylene; 1,3-butadiene; isobutane; butane; propyne; ethylene
 Clean air act (CAA) 112 regulated flammable substances: but-1-ene; propadiene; pentane; isopentane; 2-methylpropene; acetylene; (Z)-but-2-ene; propane; methane; ethane; (E)-but-2-ene; propylene; 1,3-butadiene; isobutane; butane; propyne; ethylene
 Clean air act (CAA) 112 regulated toxic substances: No products were found.

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	0.02 - 10
1,3-Butadiene	106-99-0	0.0001 - 5
Hexane	110-54-3	0.0001 - 1
Toluene	108-88-3	0.0001 - 1
Benzene	71-43-2	0.00005 - 0.9

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

Supplier notification	:	Propylene	115-07-1	1 - 10
		Ethylene	74-85-1	0.02 - 10
		1,3-Butadiene	106-99-0	0.0001 - 5
		Hexane	110-54-3	0.0001 - 1
		Toluene	108-88-3	0.0001 - 1
		Benzene	71-43-2	0.00005 - 0.9

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** :
- Pennsylvania RTK: but-1-ene: (generic environmental hazard); pentane: (generic environmental hazard); isopentane: (generic environmental hazard); 2-methylpropene: (generic environmental hazard); carbon monoxide: (environmental hazard, generic environmental hazard); argon: (generic environmental hazard); acetylene: (generic environmental hazard); hexene: (generic environmental hazard); n-hexane: (generic environmental hazard); toluene: (environmental hazard, generic environmental hazard); octane: (generic environmental hazard); heptane: (generic environmental hazard); (Z)-but-2-ene: (generic environmental hazard); nitrogen: (generic environmental hazard); propane: (generic environmental hazard); methane: (generic environmental hazard); ethane: (generic environmental hazard); (E)-but-2-ene: (generic environmental hazard); propylene: (environmental hazard, generic environmental hazard); carbon dioxide: (generic environmental hazard); 1,3-butadiene: (special hazard, environmental hazard, generic environmental hazard); isobutane: (generic environmental hazard); butane: (generic environmental hazard); propyne: (generic environmental hazard); ethylene: (environmental hazard, generic environmental hazard); benzene: (special hazard, environmental hazard, generic environmental hazard)
 - Massachusetts RTK: but-1-ene; pentane; isopentane; 2-methylpropene; carbon monoxide; argon; acetylene; hexene; n-hexane; toluene; octane; heptane; (Z)-but-2-ene; nitrogen; propane; methane; ethane; (E)-but-2-ene; propylene; carbon dioxide; 1,3-butadiene; isobutane; butane; propyne; ethylene; benzene
 - New Jersey: propadiene; pentane; isopentane; 2-methylpropene; carbon monoxide; argon; acetylene; hexene; n-hexane; toluene; octane; heptane; nitrogen; propane; methane; ethane; propylene; carbon dioxide; 1,3-butadiene; isobutane; butane; propyne; ethylene; benzene

- 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.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>	<u>No significant risk level</u>	<u>Maximum acceptable dosage level</u>
Carbon Monoxide	No.	Yes.	No.	No.
1,3-Butadiene	Yes.	Yes.	Yes.	No.
Toluene	No.	Yes.	No.	7000 µg/day (ingestion) 13000 µg/day (inhalation)
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 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 DSL: but-1-ene; propadiene; pentane; isopentane; 2-methylpropene; carbon monoxide; argon; acetylene; hexene; n-hexane; toluene; octane; heptane; (Z)-but-2-ene; nitrogen; propane; methane; ethane; (E)-but-2-ene; propylene; carbon dioxide; 1,3-butadiene; isobutane; butane; propyne; ethylene; benzene

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

Section 16. Other information

United States

Label Requirements

- : CANCER HAZARD
CONTAINS MATERIAL WHICH CAN CAUSE CANCER
FLAMMABLE GAS.
CONTENTS UNDER PRESSURE.
HARMFUL IF INHALED.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
BLOOD, KIDNEYS, LUNGS, NERVOUS SYSTEM, REPRODUCTIVE SYSTEM, LIVER,
MUCOUS MEMBRANES, HEART, PERIPHERAL NERVOUS SYSTEM,
CARDIOVASCULAR SYSTEM, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS
SYSTEM, EYE, LENS OR CORNEA, MUSCLE TISSUE.
VAPOR MAY CAUSE FLASH FIRE.
MAY BE HARMFUL IF SWALLOWED.
MAY CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

Canada

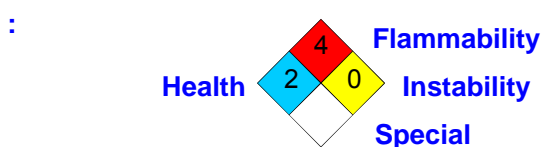
Label Requirements

- : Class A: Compressed 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).

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

Health	*	2
Fire hazard		4
Reactivity		0
Personal protection		C

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.