

Material Safety Data Sheet



Flammable Gas Mixture: 1 Butene / 1,3 Butadiene / Acetylene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Cyclopropane / Ethane / Ethylene / Hexane / Hydrogen / Hydrogen Sulfide / Isobutane / Isobutylene / Isopentane / Methane / N Butane / N Pentane / Nitrogen / Propane / Propylene / Trans-2-Butene

Section 1. Chemical product and company identification

- Product Name** : Flammable Gas Mixture: 1 Butene / 1,3 Butadiene / Acetylene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Cyclopropane / Ethane / Ethylene / Hexane / Hydrogen / Hydrogen Sulfide / Isobutane / Isobutylene / Isopentane / Methane / N Butane / N Pentane / Nitrogen / Propane / Propylene / 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#** : 006647
- Date of Preparation/Revision** : **12/1/2006.**
- 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 OR SWALLOWED.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
BLOOD, LUNGS, NERVOUS SYSTEM, REPRODUCTIVE SYSTEM, 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 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
- 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 3 (Not classifiable for human.) by IARC [cyclopropane]. 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].
MUTAGENIC EFFECTS Classified 2 by European Union [1,3-butadiene].

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TERATOGENIC EFFECT: 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>
Hydrogen	1333-74-0	5.7 - 50	ACGIH TLV (United States, 1/2004). Notes: ACGIH 2004 Adoption TWA: 1000 ppm 8 hour(s). Form: All forms Del Lietuvos Higienos Normos (Lithuania, 12/2001). TWA: 100 mg/m ³ 8 hour(s). Form: All forms ACGIH TLV (United States, 1/2004). Notes: ACGIH 2004 Adoption TWA: 1000 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). TWA: 1900 mg/m ³ 10 hour(s). Form: All forms TWA: 800 ppm 10 hour(s). Form: All forms
Methane	74-82-8	0.1 - 30	
Isobutylene	115-11-7	1 - 10	SUVA (Switzerland, 12/2003). MAK: 17500 mg/m ³ 8 hour(s). Form: All forms MAK: 10000 ppm 8 hour(s). Form: All forms Arbejdstilsynet (Denmark, 10/2002). GV: 172 mg/m ³ 8 hour(s). Form: All forms GV: 100 ppm 8 hour(s). Form: All forms Del Lietuvos Higienos Normos (Lithuania, 12/2001). TWA: 900 mg/m ³ 8 hour(s). Form: All forms TWA: 500 ppm 8 hour(s). Form: All forms Nationale MAC-lijst (Netherlands, 12/2004). Notes: TGG: 900 mg/m ³ 8 hour(s). Form: All forms TGG: 500 ppm 8 hour(s). Form: All forms AFS (Sweden, 3/2000). NGV: 900 mg/m ³ 8 hour(s). Form: All forms NGV: 500 ppm 8 hour(s). Form: All forms LV Nat. Standardisation and Meterological Centre (Latvia, 12/1998). TWA: 100 mg/m ³ 8 hour(s). Form: All forms ACGIH TLV (United States, 9/2004). STEL: 54000 mg/m ³ 15 minute(s). Form: All forms STEL: 30000 ppm 15 minute(s). Form: All forms TWA: 9000 mg/m ³ 8 hour(s). Form: All forms TWA: 5000 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). STEL: 54000 mg/m ³ 15 minute(s). Form: All forms STEL: 30000 ppm 15 minute(s). Form: All forms TWA: 9000 mg/m ³ 10 hour(s). Form: All forms TWA: 5000 ppm 10 hour(s). Form: All forms OSHA PEL (United States, 6/1993). TWA: 9000 mg/m ³ 8 hour(s). Form: All forms
Isobutane	75-28-5	0.08 - 10	
trans-2-butene	624-64-6	1 - 10	SUVA (Switzerland, 12/2003). MAK: 17500 mg/m ³ 8 hour(s). Form: All forms MAK: 10000 ppm 8 hour(s). Form: All forms Arbejdstilsynet (Denmark, 10/2002). GV: 172 mg/m ³ 8 hour(s). Form: All forms GV: 100 ppm 8 hour(s). Form: All forms Del Lietuvos Higienos Normos (Lithuania, 12/2001). TWA: 900 mg/m ³ 8 hour(s). Form: All forms TWA: 500 ppm 8 hour(s). Form: All forms Nationale MAC-lijst (Netherlands, 12/2004). Notes: TGG: 900 mg/m ³ 8 hour(s). Form: All forms TGG: 500 ppm 8 hour(s). Form: All forms AFS (Sweden, 3/2000). NGV: 900 mg/m ³ 8 hour(s). Form: All forms NGV: 500 ppm 8 hour(s). Form: All forms LV Nat. Standardisation and Meterological Centre (Latvia, 12/1998). TWA: 100 mg/m ³ 8 hour(s). Form: All forms ACGIH TLV (United States, 9/2004). STEL: 54000 mg/m ³ 15 minute(s). Form: All forms STEL: 30000 ppm 15 minute(s). Form: All forms TWA: 9000 mg/m ³ 8 hour(s). Form: All forms TWA: 5000 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). STEL: 54000 mg/m ³ 15 minute(s). Form: All forms STEL: 30000 ppm 15 minute(s). Form: All forms TWA: 9000 mg/m ³ 10 hour(s). Form: All forms TWA: 5000 ppm 10 hour(s). Form: All forms OSHA PEL (United States, 6/1993). TWA: 9000 mg/m ³ 8 hour(s). Form: All forms
Propylene	115-07-1	1 - 10	
Carbon Dioxide	124-38-9	0.5 - 10	ACGIH TLV (United States, 9/2004). STEL: 54000 mg/m ³ 15 minute(s). Form: All forms STEL: 30000 ppm 15 minute(s). Form: All forms TWA: 9000 mg/m ³ 8 hour(s). Form: All forms TWA: 5000 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). STEL: 54000 mg/m ³ 15 minute(s). Form: All forms STEL: 30000 ppm 15 minute(s). Form: All forms TWA: 9000 mg/m ³ 10 hour(s). Form: All forms TWA: 5000 ppm 10 hour(s). Form: All forms OSHA PEL (United States, 6/1993). TWA: 9000 mg/m ³ 8 hour(s). Form: All forms

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TWA: 5000 ppm 8 hour(s). Form: All forms

Nitrogen 7727-37-9 1 - 10
Ethane 74-84-0 0.1 - 10

ACGIH TLV (United States, 1/2004). Notes: ACGIH 2004 Adoption

TWA: 1000 ppm 8 hour(s). Form: All forms

Carbon Monoxide 630-08-0 0.0025 - 10

ACGIH TLV (United States, 1/2005). Notes: Substances for which there is a Biological Exposure Index or Indices

TWA: 29 mg/m³ 8 hour(s). Form: All forms

TWA: 25 ppm 8 hour(s). Form: All forms

NIOSH REL (United States, 12/2001).

CEIL: 229 mg/m³ Form: All forms

CEIL: 200 ppm Form: All forms

TWA: 40 mg/m³ 10 hour(s). Form: All forms

TWA: 35 ppm 10 hour(s). Form: All forms

OSHA PEL (United States, 8/1997).

TWA: 55 mg/m³ 8 hour(s). Form: All forms

TWA: 50 ppm 8 hour(s). Form: All forms

Acetylene 74-86-2 1 - 10

NIOSH REL (United States, 6/2001).

CEIL: 2662 mg/m³ Form: All forms

CEIL: 2500 ppm Form: All forms

Ethylene 74-85-1 1 - 10

ACGIH TLV (United States, 1/2005). Notes:

ACGIH 2005 Adoption Refers to Appendix A -- Carcinogens.

TWA: 200 ppm 8 hour(s). Form: All forms

Propane 74-98-6 0.1 - 10

ACGIH TLV (United States, 1/2004). Notes: ACGIH 2004 Adoption

TWA: 1000 ppm 8 hour(s). Form: All forms

NIOSH REL (United States, 6/2001).

TWA: 1800 mg/m³ 10 hour(s). Form: All forms

TWA: 1000 ppm 10 hour(s). Form: All forms

OSHA PEL (United States, 6/1993).

TWA: 1800 mg/m³ 8 hour(s). Form: All forms

TWA: 1000 ppm 8 hour(s). Form: All forms

n-Butane 106-97-8 0.08 - 5

ACGIH TLV (United States, 1/2004). Notes: ACGIH 2004 Adoption

TWA: 1000 ppm 8 hour(s). Form: All forms

NIOSH REL (United States, 6/2001).

TWA: 1900 mg/m³ 10 hour(s). Form: All forms

TWA: 800 ppm 10 hour(s). Form: All forms

Isopentane 78-78-4 0.06 - 5

ACGIH TLV (United States, 1/2004). Notes: 1998 Adoption.

TWA: 600 ppm 8 hour(s). Form: All forms

Pentane 109-66-0 0.06 - 5

ACGIH TLV (United States, 9/2004). Notes: 1998 Adoption.

TWA: 600 ppm 8 hour(s). Form: All forms

NIOSH REL (United States, 6/2001).

CEIL: 1800 mg/m³ 15 minute(s). Form: All forms

CEIL: 610 ppm 15 minute(s). Form: All forms

TWA: 350 mg/m³ 10 hour(s). Form: All forms

TWA: 120 ppm 10 hour(s). Form: All forms

OSHA PEL (United States, 6/1993).

TWA: 2950 mg/m³ 8 hour(s). Form: All forms

TWA: 1000 ppm 8 hour(s). Form: All forms

Cyclopropane 75-19-4 1 - 5

1-Butene 106-98-9 1 - 5

cis-2-Butene 590-18-1 1 - 5

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1,3-Butadiene	106-99-0	0.0002 - 2	<p>ACGIH TLV (United States, 9/2004). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. 1994-1995 Adoption 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. TWA: 4.4 mg/m³ 8 hour(s). Form: All forms TWA: 2 ppm 8 hour(s). Form: All forms OSHA PEL (United States, 6/1993). STEL: 5 ppm 15 minute(s). Form: All forms TWA: 1 ppm 8 hour(s). Form: All forms</p>
Hexane	110-54-3	0.005 - 2	<p>ACGIH TLV (United States, 1/2004). Skin Notes: 1998 Adoption. Substances for which there is a Biological Exposure Index or Indices TWA: 50 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 12/2001). TWA: 180 mg/m³ 10 hour(s). Form: All forms TWA: 50 ppm 10 hour(s). Form: All forms OSHA PEL (United States, 8/1997). TWA: 1800 mg/m³ 8 hour(s). Form: All forms TWA: 500 ppm 8 hour(s). Form: All forms</p>
Hydrogen Sulfide	7783-06-4	0.001 - 0.9	<p>ACGIH TLV (United States, 9/2004). Notes: 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. STEL: 21 mg/m³ 15 minute(s). Form: All forms STEL: 15 ppm 15 minute(s). Form: All forms TWA: 14 mg/m³ 8 hour(s). Form: All forms TWA: 10 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). CEIL: 15 mg/m³ 10 minute(s). Form: All forms CEIL: 10 ppm 10 minute(s). Form: All forms OSHA PEL Z2 (United States, 6/2002). AMP: 50 ppm 10 minute(s). Form: All forms CEIL: 20 ppm Form: All forms</p>

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.

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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 immediately.

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.
Highly 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.

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.

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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 : -105.05°C (-157.1°F) based on data for: (e)-but-2-ene. Weighted average: -191.93°C (-313.5°F)

Critical temperature : The lowest known value is -240.1°C (-400.2°F) (Hydrogen).

Vapor density : The highest known value is 2 (Air = 1) (Isobutane). Weighted average: 1 (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 : Highly reactive with oxidizing agents. Slightly reactive to reactive with acids, alkalis.

Section 11. Toxicological information

<u>Ingredient name</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
Carbon Monoxide	LC50	3760 ppm (1 hour(s))	Inhalation	Rat
	LC50	2444 ppm (4 hour(s))	Inhalation	Mouse
Pentane 1,3-Butadiene	LD50	400 mg/kg	Oral	Rat
	LD50	5480 mg/kg	Oral	Rat
	LD50	3210 mg/kg	Oral	Mouse
Hydrogen Sulfide	LC50	712 ppm (1 hour (s))	Inhalation	Rat
	LC50	634 ppm (1 hour (s))	Inhalation	Mouse

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 3 (Not classifiable for human.) by IARC [cyclopropane]. 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].

MUTAGENIC EFFECTS Classified 2 by European Union [1,3-butadiene].

Contains material which causes damage to the following organs: blood, lungs, the nervous system, the reproductive system, mucous membranes, heart, peripheral nervous system, cardiovascular system, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea, muscle tissue.

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- 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
Hydrogen Sulfide	Pimephales promelas (LC50)	96 hour(s)	0.007 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	0.007 mg/l
	Pimephales promelas (LC50)	96 hour(s)	0.0071 mg/l
	Lepomis macrochirus (LC50)	96 hour(s)	0.009 mg/l
	Pimephales promelas (LC50)	96 hour(s)	0.0107 mg/l
	Oncorhynchus mykiss (LC50)	96 hour(s)	0.012 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

<u>Regulatory information</u>	<u>UN number</u>	<u>Proper shipping name</u>	<u>Class</u>	<u>Packing group</u>	<u>Label</u>	<u>Additional information</u>
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></p>

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						Forbidden
Mexico Classification	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.	2.1	Not applicable (gas).		-

Section 15. Regulatory information

United States

U.S. Federal regulations : TSCA 4(a) final test rules: Pentane; n-hexane
TSCA 8(a) PAIR: Pentane
TSCA 8(b) inventory: Methane; Propane; 2-Methylpropene; Isobutane; (e)-but-2-ene; Propylene; Pentane; Carbon Dioxide; Nitrogen; Butane; Isopentane; Ethane; (z)-but-2-ene; Carbon monoxide; Acetylene; Ethylene; cyclopropane; 1,3-butadiene; But-1-ene; Hydrogen Sulfide; Hydrogen; n-hexane
TSCA 12(b) one time export: Pentane
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: Methane; Propane; 2-Methylpropene; Isobutane; Propylene; Pentane; Carbon Dioxide; Nitrogen; Butane; Isopentane; Ethane; Carbon monoxide; Acetylene; Ethylene; cyclopropane; 1,3-butadiene; Hydrogen; n-hexane
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Methane: Fire hazard, Sudden Release of Pressure; Propane: Fire hazard, Sudden Release of Pressure; 2-Methylpropene: Fire hazard, Sudden Release of Pressure; Isobutane: Fire hazard, Sudden Release of Pressure; Propylene: Fire hazard, Sudden Release of Pressure; Pentane: Fire hazard, Immediate (Acute) Health Hazard; Carbon Dioxide: Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; Nitrogen: Sudden Release of Pressure; Butane: Fire hazard, Sudden Release of Pressure; Isopentane: Fire hazard; Ethane: Fire hazard, Sudden Release of Pressure, Immediate (Acute) Health Hazard; Carbon monoxide: Fire hazard, Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; Acetylene: Fire hazard, reactive, Sudden Release of Pressure, Immediate (Acute) Health Hazard; Ethylene: Fire hazard, reactive, Sudden Release of Pressure, Delayed (Chronic) Health Hazard; cyclopropane: Fire hazard, Sudden Release of Pressure, Delayed (Chronic) Health Hazard; 1,3-butadiene: Fire hazard, reactive, Sudden Release of Pressure, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard; Hydrogen: Fire hazard, Sudden Release of Pressure; n-hexane: Fire hazard, Immediate (Acute) Health Hazard, Delayed (Chronic) Health Hazard
Clean Water Act (CWA) 307: No products were found.
Clean Water Act (CWA) 311: No products were found.
Clean air act (CAA) 112 accidental release prevention: Methane; Propane; 2-Methylpropene; Isobutane; (e)-but-2-ene; Propylene; Pentane; Butane; Isopentane; Ethane; (z)-but-2-ene; Acetylene; Ethylene; cyclopropane; 1,3-butadiene; But-1-ene; Hydrogen Sulfide; Hydrogen
Clean air act (CAA) 112 regulated flammable substances: Methane; Propane; 2-Methylpropene; Isobutane; (e)-but-2-ene; Propylene; Pentane; Butane; Isopentane; Ethane; (z)-but-2-ene; Acetylene; Ethylene; cyclopropane; 1,3-butadiene; But-1-ene; Hydrogen
Clean air act (CAA) 112 regulated toxic substances: Hydrogen Sulfide

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 - 10
1,3-Butadiene	106-99-0	0.0002 - 2
Hexane	110-54-3	0.005 - 2

Flammable Gas Mixture: 1 Butene / 1,3 Butadiene / Acetylene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Cyclopropane / Ethane / Ethylene / Hexane / Hydrogen / Hydrogen Sulfide / Isobutane / Isobutylene / Isopentane / Methane / N Butane / N Pentane / Nitrogen / Propane / Propylene / Trans-2-Butene

Supplier notification	:	Propylene	115-07-1	1 - 10
		Ethylene	74-85-1	1 - 10
		1,3-Butadiene	106-99-0	0.0002 - 2
		Hexane	110-54-3	0.005 - 2

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: Methane: (generic environmental hazard); Propane: (generic environmental hazard); 2-Methylpropene: (generic environmental hazard); Isobutane: (generic environmental hazard); (e)-but-2-ene: (generic environmental hazard); Propylene: (environmental hazard, generic environmental hazard); Pentane: (generic environmental hazard); Carbon Dioxide: (generic environmental hazard); Nitrogen: (generic environmental hazard); Butane: (generic environmental hazard); Isopentane: (generic environmental hazard); Ethane: (generic environmental hazard); (z)-but-2-ene: (generic environmental hazard); Carbon monoxide: (environmental hazard, generic environmental hazard); Acetylene: (generic environmental hazard); Ethylene: (environmental hazard, generic environmental hazard); cyclopropane: (generic environmental hazard); 1,3-butadiene: (special hazard, environmental hazard, generic environmental hazard); But-1-ene: (generic environmental hazard); Hydrogen Sulfide: (environmental hazard, generic environmental hazard); Hydrogen: (generic environmental hazard); n-hexane: (generic environmental hazard)
 - Massachusetts RTK: Methane; Propane; 2-Methylpropene; Isobutane; (e)-but-2-ene; Propylene; Pentane; Carbon Dioxide; Nitrogen; Butane; Isopentane; Ethane; (z)-but-2-ene; Carbon monoxide; Acetylene; Ethylene; cyclopropane; 1,3-butadiene; But-1-ene; Hydrogen Sulfide; Hydrogen; n-hexane
 - New Jersey: Methane; Propane; 2-Methylpropene; Isobutane; Propylene; Pentane; Carbon Dioxide; Nitrogen; Butane; Isopentane; Ethane; Carbon monoxide; Acetylene; Ethylene; cyclopropane; 1,3-butadiene; Hydrogen Sulfide; Hydrogen; n-hexane

- 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.

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: Methane; Propane; 2-Methylpropene; Isobutane; (e)-but-2-ene; Propylene; Pentane; Carbon Dioxide; Nitrogen; Butane; Isopentane; Ethane; (z)-but-2-ene; Carbon monoxide; Acetylene; Ethylene; cyclopropane; 1,3-butadiene; But-1-ene; Hydrogen Sulfide; Hydrogen; n-hexane

Section 16. Other information

United States

- Label Requirements** :
- CANCER HAZARD
 - CONTAINS MATERIAL WHICH CAN CAUSE CANCER
 - FLAMMABLE GAS.
 - CONTENTS UNDER PRESSURE.
 - HARMFUL IF INHALED OR SWALLOWED.
 - CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS: BLOOD, LUNGS, NERVOUS SYSTEM, REPRODUCTIVE SYSTEM, 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 CAUSE RESPIRATORY TRACT, EYE AND SKIN IRRITATION.

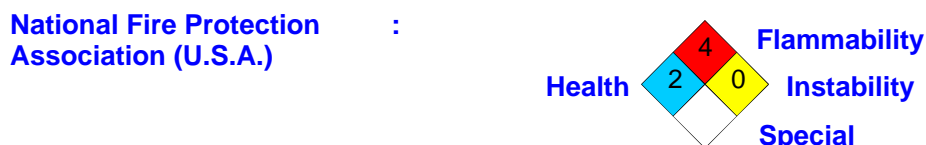
Canada

Flammable Gas Mixture: 1 Butene / 1,3 Butadiene / Acetylene / Carbon Dioxide / Carbon Monoxide / Cis-2-Butene / Cyclopropane / Ethane / Ethylene / Hexane / Hydrogen / Hydrogen Sulfide / Isobutane / Isobutylene / Isopentane / Methane / N Butane / N Pentane / Nitrogen / Propane / Propylene / Trans-2-Butene

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



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.