

Safety Data Sheet



Division of Fresno Oxygen

Barnes Welding Supply/Barnes Specialty Gases

Division of Fresno Oxygen

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Section 1: Product and Company Identification

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FOR CHEMICAL EMERGENCIES DURING TRANSPORTATION ONLY CALL INFOTRAC 1-800-535-5053

Product Name: Multigas Hydrocarbon Blend

Part Number: Certified Gas Mixture

Synonyms: Flammable Gas Mixture Natural Gas Standard CS Mixes

Recommended Use: For analytical/synthetic chemical gas uses.

Section 2: Hazards Identification



Danger

Hazard Classification:

Aspiration Hazard (Category 1)
Flammable (Category 1)
Gases Under Pressure
Reproductive Toxicity (Category 2)
Specific target organ toxicity (Repeated Exposure) (Category 2)
Specific target organ toxicity (Single Exposure) (Category 3)

Hazard Statements:

Contains gas under pressure; may explode if heated
Extremely flammable gas
May be fatal if swallowed and enters airways
May cause damage to organs through prolonged or repeated exposure
May cause respiratory irritation
Suspected of damaging fertility or the unborn child
Toxic to aquatic life with long lasting effects

Precautionary Statements

Prevention:

Do not breathe dust/fume/gas/mist/ vapors/spray..
[In case of inadequate ventilation] wear respiratory protection.
Do not handle until all safety precautions have been read and understood.
Use only outdoors or in a well-ventilated area.
Wear protective gloves, protective clothing, eye protection and face protection.
Obtain special instructions before use.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Response:

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Immediately call a poison center or doctor.
Eliminate all ignition sources if safe to do so.
Do NOT induce vomiting.
If swallowed: Rinse mouth. Do NOT induce vomiting.
If exposed or concerned: Get medical advice/attention.
If inhaled: Remove person to fresh air and keep comfortable for breathing.

Storage:

Store in a well-ventilated place. Keep container tightly closed.
Protect from sunlight.
Store locked up.

Disposal:

Dispose of contents and/or container in accordance with applicable regulations.

Section 3: Composition/Information on Ingredients

	CAS #	Concentration
N-Butane	106-97-8	3000 ppm
Carbon Dioxide	124-38-9	1.0 %
Ethane	74-84-0	5.0 %
Hexane	110-54-3	300 ppm
Isobutane	75-28-5	3000 ppm
2,2 Dimethylpropane (Neopentane)	463-82-1	1000 ppm
Nitrogen	7727-37-9	2.5 %
Propane	74-98-6	1.0 %
Methane	74-82-8	Balance

	Chemical Substance	Chemical Family	Trade Names
N-Butane	Butane	Hydrocarbons, Aliphatic, Saturated	N-BUTANE; LIQUIFIED PETROLEUM GAS; NORMAL BUTANE; BUTYL HYDRIDE; LPG; UN 1011; C4H10
Carbon Dioxide	CARBON DIOXIDE, GAS	Inorganic gases	CARBONIC ACID GAS; CARBONIC ANHYDRIDE; CARBON DIOXIDE; CARBON OXIDE; UN 1013; CO2
Ethane	ETHANE	Hydrocarbons, Aliphatic, Saturated	BIMETHYL; ETHANE, COMPRESSED; METHYLMETHANE; DIMETHYL; ETHYL HYDRIDE; UN 1035; C2H6
Hexane	HEXANE	Hydrocarbons, Aliphatic, Saturated	N-HEXANE; 1-HEXANE; HEXYL HYDRIDE; 1-HEXANE; NORMAL HEXANE; SKELLYSOLVE B; UN 1208; CAPROYL HYDRIDE; C6H14
Isobutane	ISOBUTANE	Hydrocarbons, Aliphatic, Saturated	2-METHYL PROPANE; TRIMETHYL METHANE; UN 1969; C4H10
2,2 Dimethylpropane (Neopentane)	NEOPENTANE	Hydrocarbons, Aliphatic, Saturated	TETRAMETHYLMETHANE; 2,2-DIMETHYLPROPANE; PROPANE 2,2-DIMETHYL-; TERT-PENTANE; 1,1,1-TRIMETHYLETHANE; TRIMETHYL-PROPYLMETHANE; PENTANE; UN 2044; C5H12
Nitrogen	NITROGEN, COMPRESSED GAS	Inorganic gases	DIATOMIC NITROGEN; DINITROGEN; NITROGEN; NITROGEN-14; NITROGEN GAS; UN 1066; N2
Propane	PROPANE	Hydrocarbons, Aliphatic, Saturated	N-PROPANE; DIMETHYLMETHANE; PROPYL HYDRIDE; R-290; PROPYLHYDRIDE; LIQUEFIED PETROLEUM GAS; LPG; >96% NATURAL GRADE; >99.9% PURE GRADE; UN 1978; C3H8
Methane	METHANE, COMPRESSED GAS	Hydrocarbons, Aliphatic, Saturated	FIRE DAMP; MARSH GAS; METHYL HYDRIDE; NATURAL GAS; METHANE; UN 1971; R50; CH4

Section 4: First Aid Measures

	Skin Contact	Eye Contact	Ingestion	Inhalation	Note to Physicians
N-Butane	If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.	Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	Not likely route of exposure.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.
Carbon Dioxide	If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.	Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	Do not induce vomiting.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.
Ethane	If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.	Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.
Hexane	Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.	Flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	Aspiration hazard. DO NOT induce vomiting. If vomiting occurs, keep head lower than hips to help prevent aspiration. Get immediate medical attention. Give artificial respiration if not breathing.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. Long-term exposure to n-hexane can cause damage to the peripheral nervous system.
Isobutane	If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.	Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.
2,2 Dimethylpropane (Neopentane)	If it is safe to do so, remove victim to an uncontaminated area, and place them in a comfortable position to wait for medical attention. Immediately remove contaminated clothes and shoes. Cleanse the affected skin areas thoroughly with soap under running water for 15 minutes. Seek medical treatment.	Rinse the affected eye thoroughly for 10 minutes under running water. Seek immediate medical treatment.	Seek medical treatment. Do not induce vomiting.	If it is safe to do so, remove victim to fresh air, and place them in a comfortable position to wait for medical attention. Administer oxygen or artificial respiration if breathing is difficult. Seek immediate medical treatment.	For inhalation, consider oxygen.
Nitrogen	Wash exposed skin with soap and water.	Flush eyes with plenty of water.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.
Propane	If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115 F; 41-46 C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.	Contact with liquid: Immediately flush eyes with plenty of water for at least 15 minutes. Then get immediate medical attention.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.
Methane	Wash exposed skin with soap and water.	Flush eyes with plenty of water.	If a large amount is swallowed, get medical attention.	If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.	For inhalation, consider oxygen.

Section 5: Fire Fighting Measures

	Suitable Extinguishing Media	Products of Combustion	Protection of Firefighters
N-Butane	Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray.	Carbon monoxide, carbon dioxide, water and toxic and irritating fumes.	- Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. - Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply. - NA - NA
Carbon Dioxide	Non-flammable	Non-flammable	- Any appropriate escape-type, self-contained breathing apparatus. - Non-flammable
Ethane	Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray.	Toxic gases	- Any self-contained breathing apparatus with a full facepiece. - Any self-contained breathing apparatus with a full facepiece.
Hexane	Regular dry chemical, carbon dioxide, water, regular foam Large fires: Use regular foam or flood with fine water spray.	Carbon monoxide, carbon dioxide and toxic and irritating fumes	- Any appropriate escape-type, self-contained breathing apparatus. - Protective material types: rubber
Isobutane	Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray.	Carbon monoxide, carbon dioxide, water and toxic and irritating fumes	- Any self-contained breathing apparatus with a full facepiece. - Any self-contained breathing apparatus with a full facepiece.
2,2 Dimethylpropane (Neopentane)	Carbon dioxide, regular dry chemical Large fires: Flood with fine water spray.		- Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. - Use a self-contained breathing apparatus.
Nitrogen	Non-flammable. Use suitable extinguishing media for surrounding fire. Cylinders may rupture or explode if exposed to heat.	Non-flammable	Respiratory protection may be needed for frequent or heavy exposure.
Propane	Regular dry chemical, high expansion foam Large fires: Flood with fine water spray.	Carbon monoxide, carbon dioxide, water and toxic and irritating fumes	- Any self-contained breathing apparatus with a full facepiece. - Any self-contained breathing apparatus with a full facepiece.
Methane	Carbon dioxide, regular dry chemical Large fires: Use regular foam or flood with fine water spray.	Carbon monoxide, carbon dioxide, water	- Respiratory protection may be needed for frequent or heavy exposure. Any self-contained breathing apparatus with a full facepiece. - Respiratory protection may be needed for frequent or heavy exposure. Any self-contained breathing apparatus with a full facepiece.

Section 6: Accidental Release Measures

	Personal Precautions	Environmental Precautions	Methods for Containment
N-Butane	Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Do not touch spilled material.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.
Carbon Dioxide	Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering. Do not touch spilled material.	Subject to California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65). Keep out of water supplies and sewers.	Stop leak if possible without personal risk.
Ethane	Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.
Hexane	Keep unnecessary people away, isolate hazard area and deny entry.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray.
Isobutane	Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.
2,2 Dimethylpropane (Neopentane)	Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.
Nitrogen	Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas.	No significant effects from contamination expected.	Stop leak if possible without personal risk.
Propane	Keep unnecessary people away, isolate hazard area and deny entry. Do not touch spilled material.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.
Methane	Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.	Avoid heat, flames, sparks and other sources of ignition.	Stop leak if possible without personal risk. Reduce vapors with water spray. Remove sources of ignition.

	Methods for Cleanup	Other Information
N-Butane	Stop leak, evacuate area. Use protective equipment. Contact emergency personnel.	None
Carbon Dioxide	Stop leak, evacuate, remove source of ignition.	None
Ethane	Contact emergency personnel immediately.	Not available
Hexane	Small spills: Absorb with sand or other non-combustible material. Collect spilled material in appropriate container for disposal. Large spills: Dike for later disposal. Remove sources of ignition.	Notify Local Emergency Planning Committee and State Emergency Response Commission for release greater than or equal to RQ (U.S. SARA Section 304). If release occurs in the U.S. and is reportable under CERCLA Section 103, notify the National Response Center at (800)424-8802 (USA) or (202)426-2675 (USA).
Isobutane	Contact emergency personnel. Avoid ignition sources.	None
2,2 Dimethylpropane (Neopentane)	Contact emergency personnel. Stop leak and evacuate area. Avoid sparks or fire. Cover with activated carbon. Dispose of in closed containers.	None
Nitrogen	N/A	N/A
Propane	Contact emergency personnel	None
Methane	Not available	Not available

Section 7: Handling and Storage

	Handling	Storage
N-Butane	Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.110.
Carbon Dioxide	Subject to storage regulations: U.S. OSHA 29 CFR 1910.101. Keep separated from incompatible substances.	Store and handle in accordance with all current regulations and standards
Ethane	Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.
Hexane	Store and use with adequate ventilation. Firmly secure cylinders upright to keep them from falling or being knocked over. Screw valve protection cap firmly in place by hand. Store only where temperature will not exceed 125F (52C). Store full and empty cylinders separately. Use a first-in, first-out inventory system to prevent storing full cylinders for long periods.	Do not get liquid in eyes, on skin, or clothing. Protect cylinders from damage. Use a suitable hand truck to move cylinders; do not drag, roll, slide, or drop. Open valve slowly. Close cylinder valve after each use; keep closed even when empty. If valve is hard to open, discontinue use and contact your supplier.
Isobutane	Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.110. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.
2,2 Dimethylpropane (Neopentane)	Keep container tightly closed in a locked area. Protect from sunlight. Protect from ignition sources. Secure cylinders upright to keep them from falling or being knocked over. Store only where temperature will not exceed 125F (52C).	Always handle in a well ventilated area. Use only in closed systems. Open valve slowly. Close cylinder valve after each use; keep closed even when empty. Avoid contact with skin and eyes. Keep away from heat and ignition sources.
Nitrogen	Store and handle in accordance with all current regulations and standards. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.
Propane	Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.
Methane	Store and handle in accordance with all current regulations and standards. Grounding and bonding required. Subject to storage regulations: U.S. OSHA 29 CFR 1910.101.	Keep separated from incompatible substances.

Section 8: Exposure Controls/Personal Protection

	Exposure Guidelines
N-Butane	N-BUTANE: 800 ppm (1900 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 800 ppm (1900 mg/m3) NIOSH recommended TWA 10 hour(s) LIQUIFIED PETROLEUM GAS (LPG): 1000 ppm (1800 mg/m3) OSHA TWA 1000 ppm (1800 mg/m3) NIOSH recommended TWA 10 hour(s) ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA
Carbon Dioxide	CARBON DIOXIDE, GAS: CARBON DIOXIDE: 5000 ppm (9000 mg/m3) OSHA TWA 10000 ppm (18000 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 30000 ppm (54000 mg/m3) OSHA STEL (vacated by 58 FR 35338, June 30, 1993) 5000 ppm ACGIH TWA 30000 ppm ACGIH STEL 5000 ppm (9000 mg/m3) NIOSH recommended TWA 10 hour(s) LIQUIFIED PETROLEUM GAS (LPG): 1000 ppm (1800 mg/m3) OSHA TWA 1000 ppm (1800 mg/m3) NIOSH recommended TWA 10 hour(s) ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA
Ethane	TLV-TWA: 1000ppm (Aliphatic hydrocarbon gases: Alkane C1 - C4) (ACGIH)
Hexane	N-HEXANE: 500 ppm (1800 mg/m3) OSHA TWA 50 ppm (180 mg/m3) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 50 ppm ACGIH TWA (skin) 50 ppm (180 mg/m3) NIOSH recommended TWA 10 hour(s)
Isobutane	ISOBUTANE: 800 ppm (1900 mg/m3) NIOSH recommended TWA 10 hour(s) LIQUIFIED PETROLEUM GAS (LPG): 1000 ppm (1800 mg/m3) OSHA TWA 1000 ppm ACGIH TWA 1000 ppm (1800 mg/m3) NIOSH recommended TWA 10 hour(s) ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA
2,2 Dimethylpropane (Neopentane)	NEOPENTANE: ALKANES (C5-C8): 350 mg/m3 NIOSH recommended TWA 10 hour(s); 1800 mg/m3 NIOSH recommended ceiling 15 minute(s) NEOPENTANE: 600 ppm ACGIH TWA
Nitrogen	NITROGEN, COMPRESSED GAS: NITROGEN: ACGIH (simple asphyxiant)
Propane	PROPANE: 1000 ppm (1800 mg/m3) OSHA TWA 1000 ppm (1800 mg/m3) NIOSH recommended TWA 10 hour(s) LIQUIFIED PETROLEUM GAS (LPG): 1000 ppm (1800 mg/m3) OSHA TWA 1000 ppm ACGIH TWA 1000 ppm (1800 mg/m3) NIOSH recommended TWA 10 hour(s) ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA
Methane	METHANE, COMPRESSED GAS: ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA METHANE: No occupational exposure limits established. ALIPHATIC HYDROCARBON GASES ALKANE (C1-C4): 1000 ppm ACGIH TWA

Engineering Controls

Handle only in fully enclosed systems.

	Eye Protection	Skin Protection	Respiratory Protection
N-Butane	For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.	Any supplied-air respirator with full facepiece and operated in a pressure-demand or other positive-pressure mode in combination with a separate escape supply.
Carbon Dioxide	For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.	Any appropriate escape-type, self-contained breathing apparatus.
Ethane	For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.	Any self-contained breathing apparatus with a full facepiece.
Hexane	Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	Wear appropriate chemical resistant clothing.	Any appropriate escape-type, self-contained breathing apparatus.
Isobutane	For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.	Any self-contained breathing apparatus with a full facepiece.
2,2 Dimethylpropane (Neopentane)	Wear splash resistant safety goggles with a face shield. Provide an emergency eye wash fountain and shower in work area.	Wear appropriate chemical resistant clothing.	Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode. Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
Nitrogen	Eye protection not required, but recommended.	Protective clothing is not required.	Respiratory protection may be needed for frequent or heavy exposure.
Propane	For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.	For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.	Any self-contained breathing apparatus with a full facepiece.
Methane	Eye protection not required, but recommended.	Protective clothing is not required.	Respiratory protection may be needed for frequent or heavy exposure. Any self-contained breathing apparatus with a full facepiece.

General Hygiene considerations

- Avoid breathing vapor or mist
- Avoid contact with eyes and skin
- Wash thoroughly after handling and before eating or drinking

Section 9: Physical and Chemical Properties

	Physical State	Appearance	Color	Change in Appearance	Physical Form	Odor	Taste
N-Butane	Gas	Colorless	Colorless	NA	Gas	Unpleasant odor	NA
Carbon Dioxide	Gas	Colorless	Colorless	N/A	Gas	Odorless	Acid taste
Ethane	Gas	Colorless	Colorless	N/A	Gas	Sweet odor	N/A
Hexane	Liquid	Clear	Colorless	N/A	Liquid	Faint odor, gasoline odor	N/A
Isobutane	Gas	Colorless	Colorless	N/A	Gas	Petroleum odor	N/A
2,2 Dimethylpropane (Neopentane)	Gas	Colorless	Colorless	N/A	Gas	Gasoline like	N/A
Nitrogen	Gas	Clear	Colorless	N/A	Gas	Odorless	Tasteless
Propane	Gas	Clear	Colorless	N/A	Gas	Gasoline odor	N/A
Methane	Gas	Colorless	Colorless	N/A	Gas	Odorless	Tasteless

	Flash Point	Flammability	Partition Coefficient	Autoignition Temperature	Upper Explosive Limits	Lower Explosive Limits
N-Butane	-76 F (-60 C) (CC)	NA	630.96 (log = 2.80) (estimated from water solubility)	549 F (287 C)	0.085	0.019
Carbon Dioxide	Not flammable	Not available	N/A	Nonflammable	Nonflammable	Nonflammable
Ethane	-211 F (-135 C) (CC)	Not available	812.01 (log = 2.97) (estimated from water solubility)	882 F (472 C)	0.125	0.03
Hexane	-9.4 F (-23 C) (CC); -7 F (-21.7 C) (CC)	IB	139315.68 (log = 5.148) (estimated from water solubility)	437 F (225 C)	0.075	0.011
Isobutane	-126 F (-88 C) (CC)	Not available	Not available	864 F (462 C)	0.084	0.018
2,2 Dimethylpropane (Neopentane)	<19 F (-7 C)			842 F (450 C)	0.075	0.014
Nitrogen	Not flammable	Not available	Not available	Nonflammable	Nonflammable	Nonflammable
Propane	-157 F (-105 C)	Not available	Not available	842 F (450 C)	0.095	0.021
Methane	-369 F (-223 C)	Not available	724.44 (log = 2.87) (estimated from water solubility)	999 F (537 C)	15%	5%

	Boiling Point	Freezing Point	Vapor Pressure	Vapor Density	Specific Gravity	Water Solubility	pH	Odor Threshold	Evaporation Rate	Viscosity
N-Butane	30 F (-1 C)	-216 F (-138 C)	1557 mmHg @ 20 C	2.1 (Air=1)	0.5788 @ 0 C	0.15	NA	6.16 ppm	NA	NA
Carbon Dioxide	Not available	-71 F (-57 C) @ 400 mmHg	43700 mmHg @ 21 C	1.5 (Air=1)	1.522 @ 21 C	Soluble	3.7 (saturated aqueous solution) @ 101.3 kPa (carbonic acid)	Not available	Not applicable	0.01657 cP @ 0 C
Ethane	-128 F (-89 C)	-297 F (-183 C)	28842 mmHg @ 21 C	1.05 (Air =1)	Not applicable	4.7% @ 20 C	Not applicable	899 ppm	Not applicable for gas. Refrigerated liquefied ethane will evaporate rapidly at room temperature	0.00852 cP @ 0 C
Hexane	156 F (69 C)	-139 F (-95 C)	124 mmHg @ 20 C	3 (Air=1)	0.6603	0.014% @ 20 C	Neutral	64-244 ppm	8.9 (n-butyl acetate = 1)	0.32 cP @ 25 C
Isobutane	10 F (-12 C)	-254 F (-159 C)	3.1 atm @ 21 C	2 (Air=1)	0.549 @ 20 C	Slightly soluble	Not applicable	Not available	Not applicable	0.0077 cP @ 25 C
2,2 Dimethylpropane (Neopentane)	50 F (10 C)	1 F (-17 C)	1125 mmHg @ 21.1 C	2.5 (Air=1)	0.6135	Insoluble	Not applicable	Not available	Not applicable	0.007 cP @ 21.1 C
Nitrogen	-321 F (-196 C)	-346 F (-210 C)	760 mmHg @ -196 C	0.967 (Air=1)	Not applicable	1.6% @ 20 C	Not applicable	Not available	Not applicable	0.01787 cP @ 27 C
Propane	-40 F (-40 C)	-310 F (-190 C)	6398 mmHg @ 21.1 C	1.55 (Air=1)	0.5853 @ -45 C	Very slightly soluble	Not applicable	5000-20000 ppm	Not applicable	Not available
Methane	-260 F (-162 C)	-297 F (-183 C)	760 mmHg @ -161 C	0.555 (Air=1)	Not applicable	3.5% @ 17 C	Not applicable	Not available	Not applicable	0.01118 cP @ 27 C

	Molecular Weight	Molecular Formula	Density	Weight per Gallon	Volatility by Volume	Volatility	Solvent Solubility
N-Butane	58.12	C-H3(-C-H2)2-C-H3	NA	NA	100%	NA	Alcohol, ether, chloroform
Carbon Dioxide	44.01	C-O2	0.114	Not available	Not applicable	Not applicable	Soluble: Alcohol, acetone, organic solvents
Ethane	30.07	C-H3-C-H3	1.242 g/L @ 25 C	Not available	Not available	1	Soluble: Benzene, ethanol
Hexane	86.18	C-H3(-C-H2)4-C-H3	Not available	Not available	Not available	675 g/l VOC (w/v)	Soluble: Alcohol, ether, chloroform, acetone, organic solvents
Isobutane	58.12	C4-H10	Not available	Not available	100%	Not applicable	Soluble: Alcohol, ether, chloroform
2,2 Dimethylpropane (Neopentane)	72.15	(C-H3)4-C	0.2001 lb/ft3	Not available	Not available	Not applicable	Soluble: Alcohol, ether
Nitrogen	28.0134	N2	1.2506 g/L	Not available	100%	1	Soluble: Liquid ammonia
Propane	44.11	C-H3-C-H2-C-H3	0.116	Not available	Not available	Not applicable	Soluble: Absolute alcohol, ether, chloroform, benzene, turpentine
Methane	16.04	C-H4	0.717 g/L @ 0 C	Not available	Not applicable	Not applicable	Soluble: Alcohol, ether, benzene, organic solvents

Section 10: Stability and Reactivity

	Stability	Conditions to Avoid	Incompatible Materials
N-Butane	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Oxidizing materials, halogen compounds
Carbon Dioxide	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Combustible materials, oxidizing materials, metal salts, reducing agents, metal carbide, metals, bases
Ethane	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Oxidizing materials, halogens,
Hexane	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Oxidizing materials, halogens, combustible materials, chlorine dioxide, fluorine, nitrogen dioxide, potassium chlorate, chlorine, chlorosulfuric acid
Isobutane	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Oxidizing materials, halogen compounds
2,2 Dimethylpropane (Neopentane)	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Oxidizing materials
Nitrogen	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Metals, oxidizing materials
Propane	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Oxidizing materials, combustible materials, halogen compounds,
Methane	Stable at normal temperatures and pressure.	Stable at normal temperatures and pressure.	Halogens, oxidizing materials, combustible materials

	Hazardous Decomposition Products	Possibility of Hazardous Reactions
N-Butane	Oxides of carbon.	Will not polymerize.
Carbon Dioxide	Carbon monoxide	Will not polymerize.
Ethane	Oxides of carbon	Will not polymerize.
Hexane	Oxides of carbon	Will not polymerize.
Isobutane	Oxides of carbon	Will not polymerize.
2,2 Dimethylpropane (Neopentane)	Oxides of carbon	Will not polymerize.
Nitrogen	Oxides of nitrogen	Will not polymerize.
Propane	Oxides of carbon	Will not polymerize.
Methane	Oxides of carbon	Will not polymerize.

Section 11: Toxicology Information

Acute Effects

	Oral LD50	Dermal LD50	Inhalation
N-Butane	LC(50): 658 mg/l (270,000 ppm) butane (4 hour-rat)	Not established	Irritation, nausea, vomiting, headache, drowsiness, symptoms of drunkenness, tingling sensation, suffocation, convulsions, coma, can displace oxygen at high concentrations
Carbon Dioxide	Not established	Not established	Ringling in the ears, nausea, irregular heartbeat, headache, drowsiness, dizziness, tingling sensation, visual disturbances, suffocation, convulsions, coma
Ethane	Not available	Not available	Irritation, nausea, vomiting, irregular heartbeat, headache, dizziness, disorientation, emotional disturbances, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma
Hexane	>5 gm/kg oral-rat LD50	>2 gm/kg skin-rabbit LD50	Irritation, nausea, irregular heartbeat, headache, drowsiness, dizziness, mood swings, loss of coordination, lung congestion, nerve damage, brain damage, unconsciousness
Isobutane	LC50, 1 hr, rat = 285,000 ppmv	Not available	Irritation, nausea, vomiting, headache, symptoms of drunkenness, suffocation, convulsions, coma
2,2 Dimethylpropane (Neopentane)	Not established	Not established	Nausea, vomiting, dizziness, suffocation, convulsions, coma
Nitrogen	Not available	Not available	Nausea, vomiting, difficulty breathing, headache, drowsiness, dizziness, tingling sensation, loss of coordination, convulsions, coma
Propane	LC50 Inhalation Gas. Rat >800000 ppm 15 minutes	Not available	Nausea, vomiting, irregular heartbeat, headache, symptoms of drunkenness, disorientation, suffocation, convulsions, coma
Methane	Not available	Not available	Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, drowsiness, fatigue, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma

	Eye Irritation	Skin Irritation	Sensitization
N-Butane	Frostbite, blurred vision	Blisters, frostbite	Central nervous system depression, difficulty breathing
Carbon Dioxide	Irritation, frostbite, blurred vision	Liquid: blisters, frostbite	Difficulty breathing
Ethane	Frostbite	Frostbite	Difficulty breathing
Hexane	Mild irritation	Irritation	Reproductive toxicity, Category 2: H361f: Suspected of damaging fertility. Aspiration hazard, Category 1: H304: May be fatal if swallowed and enters airways. Specific Target Organ Toxicity (repeated exposure), Category 2: H373: May cause damage to organs through prolonged or repeated exposure. Skin irritation, Category 2: H315: Causes skin irritation. Specific Target Organ Toxicity (single exposure), Category 3: H336: May cause drowsiness or dizziness. Hazardous to the aquatic environment, Chronic Category 2: H411: Toxic to aquatic life with long lasting effects
Isobutane	Liquid: frostbite, blurred vision	Liquid: blisters, frostbite	Respiratory tract irritation, central nervous system depression, difficulty breathing
2,2 Dimethylpropane (Neopentane)	Mild irritation, frostbite, blurred vision	Blisters, frostbite	Difficulty breathing
Nitrogen	Contact with rapidly expanding gas may cause burns or frostbite	No information on significant adverse effects	Difficulty breathing
Propane	Liquid: frostbite, blurred vision	Liquid: blisters, frostbite	Central nervous system depression, difficulty breathing
Methane	No information on significant adverse effects	No information on significant adverse effects	Difficulty breathing

Chronic Effects

	Carcinogenicity	Mutagenicity	Reproductive Effects	Developmental Effects
N-Butane	None	Not established	Not established	No data
Carbon Dioxide	Not available	Not established	Available	No data
Ethane	Not Listed.	Not available	Not available	No data
Hexane	Not listed.	Available.	Available.	No data
Isobutane	Not available	Not available	Not available	No data
2,2 Dimethylpropane (Neopentane)	Not listed	Not established	Not established	No data
Nitrogen	Not hazardous	Not available	Not available	No data
Propane	Not available	Not available	Not available	No data
Methane	Not available	Not available	Not available	No data

Section 12: Ecological Information

Fate and Transport

	Eco toxicity	Persistence / Degradability	Bioaccumulation / Accumulation	Mobility in Environment
N-Butane	Fish toxicity: NA Invertebrate toxicity: NA Algal toxicity: NA Phyto toxicity: NA Other toxicity: Expected to exist entirely in the vapor phase in ambient air.	NA	NA	NA
Carbon Dioxide	Fish toxicity: 150000 ug/L 48 day(s) (Mortality) Brown trout (Salmo trutta) Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Relatively non-persistent in the environment. Moderately volatile from water.	Accumulates very little in the bodies of living organisms.	Leaches through the soil
Ethane	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Relatively non-persistent in the environment. Highly volatile from water.	Accumulates very little in the bodies of living organisms.	Leaches through the soil or the sediment at a slow rate.
Hexane	Fish toxicity: 2500 ug/L 96 hour(s) LC50 (Mortality) Fathead minnow (Pimephales promelas) Invertebrate toxicity: Not available Algal toxicity: 75 ug/L 28 hour(s) (Population Growth) Green algae (Chlamydomonas sp) Phyto toxicity: Not available Other toxicity: Not available	Relatively non-persistent in the environment. Highly volatile from water.	Accumulates very little in the bodies of living organisms.	Not expected to leach through the soil or the sediment.
Isobutane	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available
2,2 Dimethylpropane (Neopentane)	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available
Nitrogen	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available
Propane	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Not available	Not available	Not available
Methane	Fish toxicity: Not available Invertebrate toxicity: Not available Algal toxicity: Not available Phyto toxicity: Not available Other toxicity: Not available	Relatively non-persistent in the environment. Moderately volatile from water.	Accumulates very little in the bodies of living organisms.	Not expected to leach through the soil or the sediment.

Section 13: Disposal Considerations

N-Butane	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Carbon Dioxide	Dispose in accordance with all applicable regulations.
Ethane	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Hexane	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Isobutane	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
2,2 Dimethylpropane (Neopentane)	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Nitrogen	Dispose in accordance with all applicable regulations.
Propane	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.
Methane	Dispose in accordance with all applicable regulations. Subject to disposal regulations: U.S. EPA 40 CFR 262. Hazardous Waste Number(s): D001.

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

DOT Information For This Mixture

Shipping Name	Compressed gas, flammable, n.o.s. (Methane, 2,2 Dimethylpropane (Neopentane))
UN Number	UN1954
Hazard Class	2.1
Hazard Information	FLAMMABLE GAS

Individual Component Information

	Proper Shipping Name	ID Number	Hazard Class or Division	Packing Group	Labeling Requirements	Passenger Aircraft or Railcar Quantity Limitations	Cargo Aircraft Only Quantity Limitations	Additional Shipping Description
N-Butane	Butane	UN1011	2.1	Not applicable	2.1	Forbidden	150 kg	NA
Carbon Dioxide	Carbon dioxide	UN1013	2.2	Not applicable	2.2	75 kg or L	150kg	None
Ethane	Ethane	UN1035	2.1	Not applicable	2.1	Forbidden	150 kg	N/A
Hexane	Hexanes	UN1208	3	II	3	5 kg or L	N/A	N/A
Isobutane	ISOBUTANE see also PETROLEUM GASES, LIQUEFIED	UN1969	2.1	Not applicable	2.1	Forbidden	150 kg	N/A
2,2 Dimethylpropane (Neopentane)	2,2-Dimethylpropane	UN2044	2.1	Not applicable	2.1	Forbidden	150 kg	None
Nitrogen	Nitrogen, compressed	UN1066	2.2	Not applicable	2.2	75 kg or L	150 kg	N/A
Propane	Propane	UN1978	2.1	Not applicable	2.1	Forbidden	150 kg	N/A
Methane	Methane, compressed	UN1971	2.1	Not applicable	2.1	Forbidden	150 kg	N/A

Canadian Transportation of Dangerous Goods

	Shipping Name	UN Number	Class	Packing Group / Risk Group
N-Butane	Butane	UN 1011	2.1	NA
Carbon Dioxide	Carbon dioxide	UN1013	2.2	Not applicable
Ethane	Ethane	UN1035	2.1	Not applicable
Hexane	Hexanes	UN1208	3	II
Isobutane	Isobutane	UN1969	2.1	Not applicable
2,2 Dimethylpropane (Neopentane)	2,2-Dimethylpropane	UN2044	2.1	Not applicable
Nitrogen	Nitrogen, compressed	UN1066	2.2	Not applicable
Propane	Propane	UN1978	2.1	Not applicable
Methane	Methane, compressed	UN1971	2.1	Not applicable

Section 15: Regulatory Information

U.S. Regulations

	CERCLA Sections	SARA 355.30	SARA 355.40
N-Butane	Not regulated.	Not regulated.	Not regulated.
Carbon Dioxide	Not regulated.	Not regulated.	Not regulated.
Ethane	Not regulated.	Not regulated.	Not regulated.
Hexane	5000 LBS RQ	Not regulated.	Not regulated.
Isobutane	Not regulated.	Not regulated.	Not regulated.
2,2 Dimethylpropane (Neopentane)	Not regulated.	Not regulated.	Not regulated.
Nitrogen	Not regulated.	Not regulated.	Not regulated.
Propane	Not regulated.	Not regulated.	Not regulated.
Methane	Not regulated.	Not regulated.	Not regulated.

SARA 370.21

	Acute	Chronic	Fire	Reactive	Sudden Release
N-Butane	Yes	No	Yes	No	Yes
Carbon Dioxide	Yes	No	No	No	Yes
Ethane	Yes	No	Yes	No	Yes
Hexane	Yes	Yes	Yes	No	No
Isobutane	Yes	No	Yes	No	Yes
2,2 Dimethylpropane (Neopentane)	Yes	No	Yes	No	Yes
Nitrogen	Yes	No	No	No	Yes
Propane	Yes	No	Yes	No	Yes
Methane	Yes	No	Yes	No	Yes

SARA 372.65

N-Butane	Not regulated.
Carbon Dioxide	Not regulated.
Ethane	Not regulated.
Hexane	N-HEXANE
Isobutane	Not regulated.
2,2 Dimethylpropane (Neopentane)	Not regulated.
Nitrogen	Not regulated.
Propane	Not regulated.
Methane	Not regulated.

OSHA Process Safety

N-Butane	Not regulated.
Carbon Dioxide	Not regulated.
Ethane	Not regulated.
Hexane	Not regulated.
Isobutane	Not regulated.
2,2 Dimethylpropane (Neopentane)	Not regulated.
Nitrogen	Not regulated.
Propane	Not regulated.
Methane	Not regulated.

State Regulations

	CA Proposition 65
N-Butane	Not regulated.
Carbon Dioxide	Not regulated.
Ethane	Not regulated.
Hexane	Not regulated.
Isobutane	Not regulated.
2,2 Dimethylpropane (Neopentane)	Not regulated.
Nitrogen	Not regulated.
Propane	Not regulated.
Methane	Not regulated.

Canadian Regulations

	WHMIS Classification
N-Butane	A, B1
Carbon Dioxide	A
Ethane	A, B1.
Hexane	B2, D2A, D2B
Isobutane	A, B1.
2,2 Dimethylpropane (Neopentane)	A B1
Nitrogen	A
Propane	A, B1.
Methane	A, B1

National Inventory Status

	US Inventory (TSCA)	TSCA 12b Export Notification	Canada Inventory (DSL/NDSL)
N-Butane	Listed on inventory.	Not listed.	Listed on inventory.
Carbon Dioxide	Listed on inventory.	Not listed.	Listed on inventory.
Ethane	Listed on inventory.	Not listed.	Listed on inventory.
Hexane	Listed on inventory.	Not listed.	Listed on DSL.
Isobutane	Listed on inventory.	Not listed.	Listed on inventory.
2,2 Dimethylpropane (Neopentane)	Listed on inventory.	Not listed.	Not determined.
Nitrogen	Listed on inventory.	Not listed.	Listed on inventory.
Propane	Listed on inventory.	Not listed.	Listed on inventory.
Methane	Listed on inventory.	Not listed.	Listed on inventory.

Section 16: Other Information

	NFPA Rating
N-Butane	HEALTH=1 FIRE=4 REACTIVITY=0
Carbon Dioxide	HEALTH=2 FIRE=0 REACTIVITY=0
Ethane	HEALTH=2 FIRE=4 REACTIVITY=0
Hexane	HEALTH=2 FIRE=3 REACTIVITY=0
Isobutane	HEALTH=2 FIRE=4 REACTIVITY=0
2,2 Dimethylpropane (Neopentane)	HEALTH=1 FIRE=4 REACTIVITY=0
Nitrogen	HEALTH=1 FIRE=0 REACTIVITY=0
Propane	HEALTH=1 FIRE=4 REACTIVITY=0
Methane	HEALTH=1 FIRE=4 REACTIVITY=0

0 = minimal hazard, 1 = slight hazard, 2 = moderate hazard, 3 = severe hazard, 4 = extreme hazard