



Safety Data Sheet

Helium, Argon, CO2

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Section 1: Product and Company Identification

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Product Code: Helium, Argon, CO2
Part Number: HELH6

Synonyms: 1025, H6, Tri Mix

Recommended Use:

Usage Restrictions:

Section 2: Hazards Identification



Warning

Hazard Classification:
Gases Under Pressure

Hazard Statements:
Contains gas under pressure; may explode if heated

Precautionary Statements

Storage:
Protect from sunlight.
Store in well-ventilated place.

Section 3: Composition/Information on Ingredients

| | CAS # | Concentration |
|----------------|-----------|---------------|
| Carbon Dioxide | 124-38-9 | 2.5% |
| Argon | 7440-37-1 | 7.5% |
| Helium | 7440-59-7 | Balance |

| | Chemical Substance | Chemical Family | Trade Names |
|----------------|---------------------|------------------|---|
| Carbon Dioxide | CARBON DIOXIDE, GAS | oxides of carbon | CARBONIC ACID GAS; CARBONIC ANHYDRIDE; CARBON DIOXIDE; CARBON OXIDE; UN 1013; CO2 |
| Argon | ARGON, COMPRESSED | non-metallic | ARGON; UN 1006; AR |
| Helium | HELIUM | inorganic, gas | HELIUM GAS; HELIUM COMPRESSED; HELIUM-4; ATOMIC HELIUM; UN 1046; He |

Section 4: First Aid Measures

| | Skin Contact | Eye Contact | Ingestion | Inhalation | Note to Physicians |
|----------------|--|---|--|--|----------------------------------|
| 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. |
| Argon | Not applicable route of exposure | Flush eyes with plenty of water. | Not applicable 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. |
| Helium | 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 |
|----------------|---|------------------------|---|
| Carbon Dioxide | Non-flammable | Non-flammable | <ul style="list-style-type: none"> ▪ Any appropriate escape-type, self-contained breathing apparatus. ▪ Non-flammable |
| Argon | Non-flammable gas | Not applicable | <ul style="list-style-type: none"> ▪ N/A ▪ N/A |
| Helium | Non-flammable. Use suitable extinguishing media for surrounding fire. | Non-flammable | <ul style="list-style-type: none"> ▪ Non-flammable ▪ Non-flammable |

Section 6: Accidental Release Measures

| | Personal Precautions | Environmental Precautions | Methods for Containment |
|-----------------------|---|--|--|
| 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. |
| Argon | Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. | None known. | Stop leak if possible without personal risk. |
| Helium | Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. | Avoid soil, waterways, drains and sewers | Stop leak if possible without personal risk. |

| | Methods for Cleanup | Other Information |
|-----------------------|--|-------------------|
| Carbon Dioxide | Stop leak, evacuate, remove source of ignition. | None |
| Argon | Leaks may be detected by a soapy-water solution. | |
| Helium | Stop leak, evacuate area. Contact emergency personnel. | None |

Section 7: Handling and Storage

| | Handling | Storage |
|-----------------------|--|---|
| 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 |
| Argon | 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. | Avoid using in confined spaces. |
| Helium | 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. |

Section 8: Exposure Controls/Personal Protection

| | Exposure Guidelines |
|-----------------------|---|
| Carbon Dioxide | CARBON DIOXIDE, GAS: CARBON DIOXIDE: 5000 ppm (9000 mg/m ³) OSHA TWA 10000 ppm (18000 mg/m ³) OSHA TWA (vacated by 58 FR 35338, June 30, 1993) 30000 ppm (54000 mg/m ³) OSHA STEL (vacated by 58 FR 35338, June 30, 1993) 5000 ppm ACGIH TWA 30000 ppm ACGIH STEL 5000 ppm (9000 mg/m ³) NIOSH recommended TWA 10 hour(s) 30000 ppm (54000 mg/m ³) NIOSH recommended STEL |
| Argon | ARGON, COMPRESSED: ARGON: ACGIH (simple asphyxiant) |
| Helium | HELIUM: ACGIH (simple asphyxiant) |

Engineering Controls

Handle only in fully enclosed systems.

| | Eye Protection | Skin Protection | Respiratory Protection |
|-----------------------|--|--|--|
| 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. |
| Argon | Eye protection not required, but recommended. | Protective clothing is not required. | N/A |
| Helium | Eye protection not required, but recommended. | Protective clothing is not required. | Non-flammable |

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 |
|--|----------------|------------|-------|----------------------|---------------|------|-------|
|--|----------------|------------|-------|----------------------|---------------|------|-------|

| | Physical State | Appearance | Color | Change in Appearance | Physical Form | Odor | Taste |
|----------------|----------------|------------|-----------|----------------------|---------------|----------|------------|
| Carbon Dioxide | Gas | Colorless | Colorless | N/A | Gas | Odorless | Acid taste |
| Argon | Gas | Colorless | Colorless | N/A | Gas | Odorless | Tasteless |
| Helium | Gas | Colorless | Colorless | N/A | Gas | Odorless | Tasteless |

| | Flash Point | Flammability | Partition Coefficient | Autoignition Temperature | Upper Explosive Limits | Lower Explosive Limits |
|----------------|---------------|---------------|-----------------------|--------------------------|------------------------|------------------------|
| Carbon Dioxide | Not flammable | Not available | N/A | Nonflammable | Nonflammable | Nonflammable |
| Argon | Not flammable | | | Nonflammable | Nonflammable | Nonflammable |
| Helium | Not flammable | Not available | Not available | Nonflammable | Nonflammable | Nonflammable |

| | Boiling Point | Freezing Point | Vapor Pressure | Vapor Density | Specific Gravity | Water Solubility | pH | Odor Threshold | Evaporation Rate | Viscosity |
|----------------|-----------------|---------------------------|--------------------|---------------|------------------|------------------|--|----------------|------------------|---------------------|
| Carbon Dioxide | Not available | -71 F (-57 C) @ 4000 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 |
| Argon | -303 F (-186 C) | -308 F (-189 C) | 500 mmHg @ -190 C | 1.38 (Air=1) | Not applicable | 3.36% @ 20 C | Not applicable | Not available | Not applicable | 0.0225 cP @ 25 C |
| Helium | -452 F (-269 C) | -458 F (-272 C) @ 26 atm | 1719 mmHg @ -268 C | 0.138 (Air=1) | Not applicable | 0.94% @ 0 C | Not applicable | Not available | Not applicable | 0.02012 cP @ 26.8 C |

| | Molecular Weight | Molecular Formula | Density | Weight per Gallon | Volatility by Volume | Volatility | Solvent Solubility |
|----------------|------------------|-------------------|------------------|-------------------|----------------------|----------------|---|
| Carbon Dioxide | 44.01 | C-O2 | 0.114 | Not available | Not applicable | Not applicable | Soluble: Alcohol, acetone, hydrocarbons, organic solvents |
| Argon | 39.948 | AR | 1.784 g/L @ 0 C | Not available | 100% | Not applicable | Soluble: Organic solvents |
| Helium | 4.0026 | He | 0.1785 g/L @ 0 C | Not available | 100% | Not applicable | Insoluble: Not available |

Section 10: Stability and Reactivity

| | Stability | Conditions to Avoid | Incompatible Materials |
|----------------|---|---|--|
| 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 |
| Argon | Stable at normal temperatures and pressure. | Stable at normal temperatures and pressure. | No data available. |
| Helium | Stable at normal temperatures and pressure. | Stable at normal temperatures and pressure. | No data available. |

| | Hazardous Decomposition Products | Possibility of Hazardous Reactions |
|----------------|--------------------------------------|------------------------------------|
| Carbon Dioxide | Carbon monoxide | Will not polymerize. |
| Argon | No data available. | Will not polymerize. |
| Helium | Miscellaneous decomposition products | Will not polymerize. |

Section 11: Toxicology Information

Acute Effects

| | Oral LD50 | Dermal LD50 | Inhalation |
|----------------|-----------------|-----------------|---|
| Carbon Dioxide | Not established | Not established | Ringling in the ears, nausea, irregular heartbeat, headache, drowsiness, dizziness, tingling sensation, visual disturbances, suffocation, convulsions, coma |

| | Oral LD50 | Dermal LD50 | Inhalation |
|---------------|-----------------|-----------------|--|
| Argon | Not established | Not established | Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, dizziness, disorientation, mood swings, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma |
| Helium | Not available | Not available | Nausea, vomiting, difficulty breathing, irregular heartbeat, headache, fatigue, dizziness, disorientation, emotional disturbances, tingling sensation, loss of coordination, suffocation, convulsions, unconsciousness, coma |

| | Eye Irritation | Skin Irritation | Sensitization |
|-----------------------|---|---|----------------------|
| Carbon Dioxide | Irritation, frostbite, blurred vision | Liquid: blisters, frostbite | Difficulty breathing |
| Argon | No information on significant adverse effects | No information on significant adverse effects | Difficulty breathing |
| Helium | Liquid: frostbite, blurred vision | Liquid: frostbite | Difficulty breathing |

Chronic Effects

| | Carcinogenicity | Mutagenicity | Reproductive Effects | Developmental Effects |
|-----------------------|-----------------|-----------------|----------------------|-----------------------|
| Carbon Dioxide | Not available | Not established | Available. | No data |
| Argon | Not established | Not established | Not established | No data |
| Helium | Not available | Not available | Not available | No data |

Section 12: Ecological Information

Fate and Transport

| | Eco toxicity | Persistence / Degradability | Bioaccumulation / Accumulation | Mobility in Environment |
|-----------------------|--|---|--|--------------------------|
| 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 |
| Argon | 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 |
| Helium | 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 |

Section 13: Disposal Considerations

| | |
|-----------------------|--|
| Carbon Dioxide | Dispose in accordance with all applicable regulations. |
| Argon | Dispose in accordance with all applicable regulations. |
| Helium | Dispose in accordance with all applicable regulations. |

Section 14: Transportation Information

U.S. DOT 49 CFR 172.101

DOT Information For This Mixture

| | |
|---------------------------|--|
| Shipping Name | Compressed gas, n.o.s. (Helium, Argon) |
| UN Number | UN1956 |
| Hazard Class | 2.2 |
| Hazard Information | Non-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 |
|-----------------------|----------------------|-----------|--------------------------|----------------|-----------------------|--|--|---------------------------------|
| Carbon Dioxide | Carbon dioxide | UN1013 | 2.2 | Not applicable | 2.2 | 75 kg or L | 150kg | None |
| Argon | Argon, compressed | UN1006 | 2.2 | Not applicable | 2.2 | 75 kg or L | 150 kg | N/A |
| Helium | Helium, compressed | UN1046 | 2.2 | Not applicable | 2.2 | 75 kg or L | 150 kg | N/A |

Canadian Transportation of Dangerous Goods

| | Shipping Name | UN Number | Class | Packing Group / Risk Group |
|-----------------------|--------------------|-----------|-------|----------------------------|
| Carbon Dioxide | Carbon dioxide | UN1013 | 2.2 | Not applicable |
| Argon | Argon, compressed | UN1006 | 2.2 | Not applicable |
| Helium | Helium, compressed | UN1046 | 2.2 | Not applicable |

Section 15: Regulatory Information

U.S. Regulations

| | CERCLA Sections | SARA 355.30 | SARA 355.40 |
|-----------------------|-----------------|----------------|----------------|
| Carbon Dioxide | Not regulated. | Not regulated. | Not regulated. |
| Argon | Not regulated. | Not regulated. | Not regulated. |
| Helium | Not regulated. | Not regulated. | Not regulated. |

SARA 370.21

| | Acute | Chronic | Fire | Reactive | Sudden Release |
|-----------------------|-------|---------|------|----------|----------------|
| Carbon Dioxide | Yes | No | No | No | Yes |
| Argon | Yes | No | No | No | Yes |
| Helium | Yes | No | No | No | Yes |

SARA 372.65

| | |
|-----------------------|----------------|
| Carbon Dioxide | Not regulated. |
| Argon | Not regulated. |
| Helium | Not regulated. |

OSHA Process Safety

| | |
|-----------------------|----------------|
| Carbon Dioxide | Not regulated. |
| Argon | Not regulated. |
| Helium | Not regulated. |

State Regulations

| | CA Proposition 65 |
|-----------------------|-------------------|
| Carbon Dioxide | Not regulated. |
| Argon | Not regulated. |
| Helium | Not regulated. |

Canadian Regulations

| | WHMIS Classification |
|-----------------------|----------------------|
| Carbon Dioxide | A |
| Argon | A |
| Helium | A |

National Inventory Status

| | US Inventory (TSCA) | TSCA 12b Export Notification | Canada Inventory (DSL/NDSL) |
|-----------------------|----------------------|------------------------------|-----------------------------|
| Carbon Dioxide | Listed on inventory. | Not listed. | Listed on inventory. |
| Argon | Listed on inventory. | Not listed. | Listed on inventory. |
| Helium | Listed on inventory. | Not listed. | Not determined. |

Section 16: Other Information

| | NFPA Rating |
|-----------------------|------------------------------|
| Carbon Dioxide | HEALTH=2 FIRE=0 REACTIVITY=0 |
| Argon | HEALTH=0 FIRE=0 REACTIVITY=0 |
| Helium | HEALTH=0 FIRE=0 REACTIVITY=0 |

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