1. PRODUCT AND COMPANY IDENTIFICATION

Product Code: 00001

Product Name: Carbon Monoxide

Company Name: Gas Innovations
18005 E. Hwy 225
La Porte, TX 77571

Phone Number:
+1 (281)471-2200

Web site address: www.gasinnovations.com

Emergency Contact: 3E (within United States) +1 (866)303-2640
Information: Infotrac (outside of United States) +1 (352)323-3500

Intended Use: Industrial Use

2. HAZARDS IDENTIFICATION

Gas Under Pressure, Compressed gas
Flammable Gases, Category 1
Acute Toxicity: Inhalation, Category 3
Toxic To Reproduction, Category 1A
Specific Target Organ Toxicity (repeated exposure), Category 1

GHS Signal Word: **Danger**

GHS Hazard Phrases:
H220 - Extremely flammable gas.
H280 - Contains gas under pressure; may explode if heated.
H331 - Toxic if inhaled.
H360 - May damage fertility or the unborn child .
H372 - Causes damage to organs central nervous system through prolonged or repeated exposure.
CGA-HG04 - May form explosive mixtures with air.
CGA-HG10 - Asphyxiating even with adequate oxygen.

GHS Precaution Phrases:
P281 - Use personal protective equipment as required.
P202 - Do not handle until all safety precautions have been read and understood.
P210 - Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P260 - Do not breathe gas.
P264 - Wash hands thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.

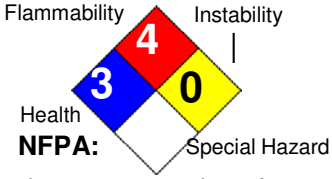
GHS Response Phrases:
P304+340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P311 - Call a POISON CENTER or doctor/physician.
P314 - Get medical attention/advice if you feel unwell.
P321 - Specific treatment see Section 4 reference to supplemental first aid instruction - if immediate measures are required.
P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
P381 - Eliminate all ignition sources if safe to do so.

GHS Storage and Disposal Phrases:
P405 - Store locked up.
P403+233 - Store container tightly closed in well-ventilated place.
P410+403 - Protect from sunlight and store in well-ventilated place.
P501 - Dispose of contents/containers in accordance with local/regional/national/international regulations.

Additional Hazards Information
Use a back flow preventative device in the piping.
Do not open valve until connected to equipment prepared for use.

Close valve after each use and when empty.

Hazard Rating System:



Potential Health Effects (Acute and Chronic): Chemical asphyxiant. Exposure to low concentrations for extended periods may result in dizziness or unconsciousness, and may lead to death.

Inhalation: May be harmful if inhaled. May cause respiratory tract irritation. This material can act as a simple asphyxiant by displacement of air.

Skin Contact: May be harmful if absorbed through the skin. May cause skin irritation.

Eye Contact: May cause eye irritation.

Ingestion: May be harmful if swallowed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS #	Hazardous Components (Chemical Name)	Concentration

4. FIRST AID MEASURES

Emergency and First Aid Procedures: Consult a physician. Show this safety data sheet to the doctor in attendance. Move out of dangerous area.

In Case of Inhalation: If breathed in, move person into fresh air. If not breathing give artificial respiration. If breathing is difficult, give oxygen. Consult a physician.

In Case of Skin Contact: Wash skin with soap and water. If skin irritation occurs, get medical advice/attention.

In Case of Eye Contact: Immediately flush eyes with plenty of water for at least 15 minutes. Hold eyelids apart and flush eyes with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Have eyes examined and tested by medical personnel.

In Case of Ingestion: Not expected to be a primary route of exposure.

Signs and Symptoms Of Exposure: Effects are due to lack of oxygen. Moderate concentrations may cause headache, drowsiness,dizziness, excitation, excess salivation, vomiting, and unconsciousness. Prolonged exposure to low concentrations of carbon monoxide can be fatal.

5. FIRE FIGHTING MEASURES

Flash Pt: NA Method Used: Not Applicable

Explosive Limits: LEL: 12.5%(V) UEL: 74 % (V)

Autoignition Pt: 605 C (1120 F)

Suitable Extinguishing Media: Dry chemical, CO2 or water spray.

Fire Fighting Instructions: Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with OSHA 29 CFR 1910.156 and applicable standards under 29 CFR 1910 Subpart L-Fire Protection.

If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive

atmospheres may linger.
EXTREMELY FLAMMABLE GAS. Carbon monoxide cannot be detected by odor. May form explosive mixtures with air. Toxic, flammable gas may spread. Before entering area, especially a confined area, check atmosphere with an appropriate gas-specific device. Reduce gas with fog or fine water spray. Shut off source of gas flow if safe to do so. Ventilate area or move container to a well-ventilated area.

Flammable Properties and Hazards: Can form explosive mixture with air and oxidizing agents.

6. ACCIDENTAL RELEASE MEASURES

Protective Precautions, Protective Equipment and Emergency Procedures: Use proper personal protective equipment as indicated in Section 8.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

Steps To Be Taken In Case Material Is Released Or Spilled: Cannot be detected by odor. Forms explosive mixtures with air. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if safe to do so. Reduce vapors with fog or fine water spray, taking care not to spread liquid with water. Shut off flow if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable vapors may spread from leak and could explode if reignited by sparks or flames. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device.

7. HANDLING AND STORAGE

Precautions To Be Taken in Handling: Keep away from heat, sparks and flame. Keep away from sources of ignition - No smoking. Use spark-proof tools and explosion proof equipment. Use in a closed system. Avoid using pure nickel.

Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g., wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents.

Precautions To Be Taken in Storing: Store only where temperature will not exceed 125°F (52°C). Post "No Smoking or Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g., NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

Other Precautions: When handling product under pressure, use piping and equipment adequately designed

to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CAS #	Partial Chemical Name	OSHA TWA	ACGIH TWA	Other Limits

Respiratory Equipment (Specify Type): When workplace conditions warrant respirator use, follow a respiratory protection program that meets OSHA 29 CFR 1910.134, ANSI Z88.2, or MSHA 30 CFR 72.710 (where applicable). Use an air-supplied or air-purifying cartridge if the action level is exceeded. Ensure that the respirator has the appropriate protection factor for the exposure level. If cartridge type respirators are used, the cartridge must be appropriate for the chemical exposure (e.g., an organic vapor cartridge). For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Eye Protection: Wear safety glasses when handling cylinders; vapor-proof goggles and a face shield during cylinder change out or whenever contact with product is possible. Select eye protection in accordance with OSHA 29 CFR 1910.133.

Protective Gloves: Wear neoprene gloves during cylinder change out or wherever contact with product is possible.

Other Protective Clothing: Wear metatarsal shoes for cylinder handling, and protective clothing where needed.

Engineering Controls (Ventilation etc.): Use explosion-proof ventilation equipment.

Work/Hygienic/Maintenance Practices: Avoid contact with skin, eyes and clothing. Wash hands before breaks and immediately after handling the product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical States: [X] Gas [ ] Liquid [ ] Solid

Appearance and Odor: Appearance: colorless.
Odor: Odorless.

Critical pressure: 3499 kPa
Log Pow: 1.78

Melting Point: -205 C (-337 F)

Boiling Point: -192 C (-313 F)

Decomposition Temperature: 400 C (752 F)

Autoignition Pt: 605 C (1120 F)

Flash Pt: NA Method Used: Not Applicable

Explosive Limits: LEL: 12.5%(V) UEL: 74 % (V)

Specific Gravity (Water = 1): 1.2501 - kg/m3 at 0 C (32.0 F)

Vapor Pressure (vs. Air or mm Hg): No data.

Vapor Density (vs. Air = 1): 0.97 (Air=1)

Evaporation Rate: No data.

Solubility in Water: 41 g/L at 20.0 C (68.0 F)

pH: NA **Percent**

Volatile: No data. **Molecular**

Formula & Weight: CO 28.01

10. STABILITY AND REACTIVITY

Reactivity: Can form explosive mixture with air and oxidizing agents.

Stability: Unstable [ ] Stable [X]

Conditions To Avoid - Instability: Heat, flames and sparks. No smoking.

Incompatibility - Materials To Avoid: Oxidizing agents. Oxygen, flammable materials, metal oxides. Halogenated compounds, Metals (when wet), Sulfur and Sulfite compounds.

Hazardous Decomposition Or Byproducts: Carbon monoxide will decompose above 752F (400C) to form carbon dioxide and carbon.

Possibility of Hazardous Reactions: Will occur [ ] Will not occur [X]

Conditions To Avoid - Hazardous Reactions: No data available.

11. TOXICOLOGICAL INFORMATION

Toxicological Information: Germ cell mutagenicity: Not classified.
Reproductive toxicity: May damage fertility. May damage the unborn child.
Specific target organ toxicity - repeated exposure: Causes damage to organs (central nervous system) through prolonged or repeated exposure.

Acute toxicity, LC50, Inhalation, Rat, 1800ppm, 4 H.

Irritation or Corrosion: None that are directly attributable to normal use of this material.

Chronic Toxicological Effects: No data available.

Carcinogenicity: NTP? No IARC Monographs? No OSHA Regulated? No

12. ECOLOGICAL INFORMATION

General Ecological Information: Classification criteria are not met. No ecological damage caused by this product.

Persistence and Degradability: Will not undergo hydrolysis. Not readily biodegradable. Not applicable for inorganic gases.

Bioaccumulative Potential: Not expected.

Mobility in Soil: No data available. Because of its high volatility, the product is unlikely to cause ground or water pollution.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Do not attempt to dispose of residual or unused quantities. Return container to supplier. Dispose of contents/containers in accordance with local/regional/national/international regulations.

Waste Disposal Method: D001

14. TRANSPORT INFORMATION

LAND TRANSPORT (US DOT):

DOT Proper Shipping Name: Carbon monoxide, compressed.
DOT Hazard Class: 2.3 POISON GAS
UN/NA Number: UN1016

DOT Special Provisions (49CFR 172.102) - This material is poisonous by inhalation (see 171.8 of this subchapter) in Hazard Zone D (see 173.116(a) of this subchapter), and must be described as an inhalation hazard under the provisions of this subchapter.

15. REGULATORY INFORMATION

EPA SARA (Superfund Amendments and Reauthorization Act of 1986) Lists

CAS #	Hazardous Components (Chemical Name)	S. 302 (EHS)	S. 304 RQ	S. 313 (TRI)

CAS #	Hazardous Components (Chemical Name)	Other US EPA or State Lists

CAS #	Hazardous Components (Chemical Name)	International Regulatory Lists

16. OTHER INFORMATION

Revision Date: 03/18/2015
Preparer Name: RSB Environmental
Additional Information About This Product: No data available.
Company Policy or Disclaimer: The information, recommendations, and suggestions herein were compiled from reference material and other sources believed to be reliable. However, the SDS's accuracy or completeness is not guaranteed by Gas Innovations or its affiliates, nor is any responsibility assumed or implied for any loss or damage resulting from inaccuracies or omissions. Since conditions of use are beyond our control, no warranties of merchantability of fitness for a particular purpose are expressed or implied. This SDS is not intended as a license to operate under, or a recommendation to infringe on, any patents. Appropriate warnings and safe handling procedures should be provided to handlers and users.