

Material Safety Data Sheet

1. Product and Company Identification

Product Name: Compressed Gases, N.O.S. (Nitrogen, Helium, Carbon Dioxide, Carbon Monoxide)
Product Use: Welding of metals, many
Trade Name: Welding gas
Synonyms: N/A
IUPAC Name: N/A
Chemical Formula: N/A
Supplier: Sunox Industrial Gases Inc.
440 Sheldon Drive.
Cambridge, Ontario N1T 2C1
Tel: 1-800-342-6563
Emergency Contact: CANUTEC (24hr) @ 1-613-996-6666



2. Composition and Ingredient Information

Component	CAS Number	Concentration [%vol]
Nitrogen	7727-37-9	25-90%
Helium	7440-59-7	25-50%
Carbon Dioxide	124-38-9	2-10%
Carbon Monoxide	630-08-0	1-5%

3. Hazards Identification

Emergency Overview

WARNING! Colourless and odourless gas under high pressure. General asphyxiate and will cause rapid suffocation. Flammable gas that can rapidly accelerate combustion. May cause dizziness, drowsiness, increased breathing rate and increased heart rate. Harmful if inhaled, can cause blood damage and can be toxic to the central nervous system. Carbon dioxide may mix with water and form carbonic acid. Self contained breathing apparatus may be required by rescue workers.

Effect of an Acute Overexposure

Eye Contact: Possible tissue damage or burns
Skin Contact: Possible tissue damage or burns
Ingestion: Unlikely route of exposure
Inhalation: Most effects due to general asphyxiant properties. Moderate concentrations of around 7-8% CO₂ in air may cause labored breathing, headache, dizziness and sweating. Concentrations over 10% CO₂ in air may result in unconsciousness within several minutes. Damage to the central nervous system possible.
Carbon monoxide content can result in above symptoms as well as pain in extremities, tremors, hearing loss, eye damage, blood disorders, convulsions and coma.

Effect of Chronic Overexposure

- Eye Contact: Dryness, tearing, severe irritation of the eyes
Skin Contact: Tissue damage to due to acid generation
Ingestion: Unlikely route of exposure
Inhalation: Raised blood pH level, brain central nervous system effects. Carbon monoxide content can result in heart disorders, blood disorders, heart damage, nerve damage, reproductive effects, birth defects and brain damage.

4. First Aid Measures

- Eye Contact: Immediately flush eyes with warm water for 15 minutes. Consult a doctor if discomfort continues.
Skin Contact: Flush area with warm water, consult a doctor if discomfort continues.
Ingestion: Unlikely, rinse mouth with plenty of water if acid generation is suspected. Consult a doctor if discomfort continues.
Inhalation: Remove individual to fresh air, give artificial respiration if not breathing.

5. Fire Fighting Measures

Flammable?	No
Suitable Extinguishing Media:	N/A
Unsuitable Extinguishing Media:	N/A
Products of Combustion:	N/A
Sensitivity to Impact:	Avoid
Sensitivity to Static Discharge:	Avoid
Flash Point:	N/A
Autoignition Temperature:	N/A
Flammable Limits in Air, % vol, Upper	N/A
Flammable Limits in Air, % vol, Lower	N/A

Protection of Firefighters

WARNING! Evacuate all personnel from area. Cool cylinders from an extended distance with water spray. Cylinders equipped with a pressure relief valve to release contents in high pressure situations. If relief device fails, cylinder may rupture or explode. Wear a self-contained breathing apparatus.

6. Accidental Release Measures

Personal Precautions

Evacuate all personnel from the danger area and use a self contained breathing apparatus. Stop the leak if safe to do so or move cylinder outside. Gas mix is generally heavier than air and will sink to the ground. Well ventilate area and a test for oxygen content is recommended before re-entry.

Environmental Precautions and Containment/Cleaning Methods

None required.

7. Handling and Storage

Handling Precautions

Properly train all employees on proper handling procedures. Handle cylinders with care and avoid jolting, dropping and impact. Always wear metatarsal shoes when handling and moving cylinders. Use an appropriate hand truck to move cylinders. Ensure valve protection cap is on whenever gas is not being drawn. Do not attempt to remove over tight or rusty caps with a lever bar inserted into the cap opening; use an adjustable strap wrench. Keep cylinders upright and secured to a wall or immovable object during use. Avoid damaging cylinder labels.

Storage Precautions

Store in a secured, well ventilated and cool area below a temperature of 52°C. Store away from sunlight, fire exits, sparks, heat and high traffic areas. Firmly secure cylinders upright with the valve protection cap in place by hand. Store empty and full cylinders separately. Use a first in/first out inventory system to avoid storing cylinders for an extended period of time

8. Exposure Controls and Personal Protection

Exposure Limits

Component	CAS #	TLV-TWA	TLV-STEL	TLV-C
Nitrogen	7727-37-9	N/A	N/A	N/A
Helium	7440-59-7	N/A	N/A	N/A
Carbon Dioxide	124-38-9	5000ppm, 8 hours	30,000ppm, 15 minutes	N/A
Carbon Monoxide	630-08-0	25-50ppm	-	200ppm

Generally a simple asphyxiate, carbon dioxide is toxic and can result in several adverse affects. Carbon monoxide is toxic and will result in central nervous system damage. Refer to section 2 and 11.

Environmental Controls

Actively ventilate area to remove asphyxiate gas and fumes generated from your manufacturing process.

Personal Protective Equipment (PPE)

Eye / Face: Wear safety glasses or goggles when drawing gas. Always wear goggles/welding helmet with a filter screen when welding, cutting or brazing.

Skin: Wear work gloves when handling cylinders. Cover exposed skin with flame retardant material.

Respiratory: Wear an approved respirator when welding, cutting or brazing to remove hazardous fume and gas byproducts.

General Hygiene: Wash hands before and after shift to remove potentially harmful toxic residues.

Other: Always wear metatarsal shoes while handling cylinders and operating within a manufacturing environment.

Relevant Standards: Z94.1 "Industrial Protective Headwear – Performance, Selection, Care and Use"
Z94.2 "Hearing Protection Devices – Performance, Selection, Care and Use"
Z94.3.1 "Selection, Use and Care of Protective Eyewear"
Z94.4 "Selection, Use and Care of Respirators"
Z195.1 "Guideline on Selection, Care and Use of Protective Footwear"

9. Physical and Chemical Properties

Appearance:	Colourless Gas
Odor:	None
Physical State:	Gas
Freezing Point @ 170kPa:	Not available
Boiling Point @ 170kPa:	Not available
Specific Gravity, Air @ 1atm, 0°C	Not available
Molecular Weight:	Not available
Water Solubility:	Not Available

10. Stability and Reactivity

Chemical Stability:	Stable
Conditions to Avoid:	None
Incompatible Materials:	Above 800°C nitrogen will react with lithium, neodymium, titanium and magnesium to form nitrides. At high temperatures it will also react with hydrogen and oxygen to form nitrous oxides and other compounds.
Hazardous Decomposition Products:	None
Possibility of Hazardous Reactions:	None

11. Toxicological Information

Dosage Thresholds

Component	CAS #	LD50	LC50	NOAEL
Nitrogen	7727-37-9	N/A	N/A	N/A
Helium	7440-59-7	N/A	N/A	N/A
Carbon Dioxide	124-38-9	N/A	100,000ppm/min, human, inhalation	N/A
Carbon Monoxide	630-08-0	N/A	1807ppm/4hours, rat, inhalation	N/A

See section 3 for acute and chronic effects. Chronic exposure can produce adaptation and metabolic acidosis (raised blood pH level).

Carbon dioxide is present in normal air at a concentration of about .035%. CO₂ concentrations of 1% result in a slightly increased breathing rate. CO₂ concentrations above 2% result in a breathing rate 50% above normal with prolonged exposure resulting in headache and tiredness. CO₂ concentrations above 3% result in a labored breathing twice the normal rate, with a weak narcotic effect, impaired hearing, headache, increased blood pressure and pulse rate. CO₂ concentrations between 4-5% result in breathing increased to about 4 times the normal rate, choking sensations may occur. CO₂ concentrations from 5-10% result in very laboured breathing, visual impairment, ear ringing and loss of consciousness within several minutes.

Carbon monoxide is acutely toxic normally through inhalation. Generally results in blood system disorders, heart or cardiovascular disorders, hormonal disorders and reparatory disorders. It is not considered to be mutagenic or carcinogenic. Can result is birth defects and reproductive disorders.

12. Ecological Information

Ecotoxicity: None
Degradability: None
Bioaccumulation: None
Other: None

13. Disposal Considerations

Do not throw out cylinder, return to supplier for proper waste disposal procedures.

14. Transport Information

TDG Regulation

Hazard Class 2.2
Identification Number: UN1956
Packing Group: -
Shipping Name: Compressed Gases, N.O.S. (Nitrogen, Helium, Carbon Dioxide, Carbon Monoxide)
Label: 2.2

Air Transport ICAO-TI and AITA-DGR Regulation

ICAO/IATA Class: 2.2
UN/ID Number: 1956
Label: 2.2
Packaging Group: -
Shipping Name: Compressed Gases, N.O.S. (Nitrogen, Helium, Carbon Dioxide, Carbon Monoxide)

Special Precautions

Always transport cylinder in the upright position with the valve protection cap on and firmly secured.

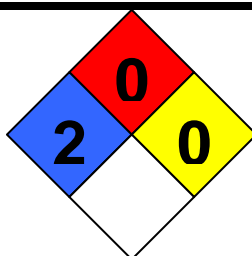
15. Regulatory Information

WHMIS Classification



Class A: Compressed
Gas

HMIS / NFPA
Rating



HEALTH	2
FIRE	0
REACTIVITY	0

CEPA (Canadian Environmental Protection Act): Not listed.
DSL (Canadian Domestic Substances List): Product is listed.

16. Other Information

Read all other documentation and labels associated with all other materials used in your applicable process. Get a MSDS for every material you use.

This product has been classified according to the hazard criteria of the CPR and this MSDS contains all information required by the CPR.

Be aware of the many other hazards associated with the welding, brazing and metal cutting processes. For more information refer to ANSI Z49.1 'Safety in Welding, Cutting and Allied Processes' published by the American Welding Society.

USE PROPER CONNECTORS accidents will occur due to faulty, old or incorrectly attached connectors. **DO NOT USE ADAPTORS.** Ensure connectors are tight and threaded properly. Properly train employees on how to connect cylinders.

The Compressed Gas Association (CGA) has a number of publications available:

AV-1	<i>Safe Handling and Storage of Compressed Gas</i>
P-1	<i>Safe Handling of Compressed Gases in Containers</i>
P-14	<i>Accident Prevention in Oxygen-Rich, Oxygen-Deficient Atmospheres</i>
SB-2	<i>Oxygen-Deficient Atmospheres</i>
V-1	<i>Compressed Gas Cylinder Valve Inlet and Outlet Connections</i>
V-7	<i>Standard Method of Determining Cylinder Valve Outlet Connections for Industrial Gas Mixtures</i>
--	<i>Handbook of Compressed Gases</i>

Compressed Gas Association
4221 Walney Road, 5th Floor
Chantilly, VA 20151
P: (703) 788-2700
F: (703) 961-1831
cga@cganet.com, www.cganet.com

DISCLAIMER: Reasonable care has been taken in the creation of this documentation; we extend no warranties and make no representation as to the accuracy or completeness of the information contained herein. We assume no responsibility regarding the suitability of this information for the user's intended purposes or for the consequences of its use. Each individual that utilizes the material described in this document should make a determination as to the suitability of the information for their particular purposes. Sunox Industrial Gases Inc. assumes no liability for personal injury, property or other damages of any nature whether compensatory, consequential, exemplary or otherwise resulting from the use of the information entailed in this document.