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**MSDS: Carbon Monoxide**

## PRODUCT INFORMATION

**PRODUCT:** Carbon Monoxide

**TRADE NAME:** Carbon Monoxide

**CHEMICAL NAME:** Carbon Monoxide

**SYNONYMS:** None

**FORMULA:** CO

**CHEMICAL FAMILY:** Nonmetal Oxide

**SUPPLIER'S NAME:** MEGS Inc.

**SUPPLIER'S ADDRESS:** 2675 De Miniac  
Ville St-Laurent, Qc, H4S 1E5

**EMERGENCY PHONE NUMBER:** (514) 956-7503

**MOLECULAR WEIGHT:** 28.01

**PRODUCT USE:** Various

**PRODUCT IDENTIFICATION** UN 1016  
**NUMBER:**

## HAZARDOUS INGREDIENTS

CHEMICAL ID	CONCENTRATION	CAS #	LD(50)	LC(50)
	100%			
Carbon Monoxide		630-08-0	None	Inhl-Man. 4,000 pm/30min

## PHYSICAL DATA

**PHYSICAL STATE:** Gas under pressure

**APPEARANCE:** Colorless gas

**ODOR:** Odorless

**ODOR THRESHOLD:** Not applicable

**SPECIFIC GRAVITY (H<sub>2</sub>O = 1):** See Vapor Density (air = 1)

**VAPOR PRESSURE:** Not applicable (gas)

**VAPOR DENSITY (air = 1):** 0.96

**EVAPORATION RATE:** Not applicable

**BOILING POINT:** -191.53°C

**FREEZING POINT:** -205.01°C

**pH:** Not applicable

**GAS DENSITY:** 1.169 kg/m<sup>3</sup> @ 15°C and 101.3 kPa

**COEFFICIENT OF WATER/OIL @ 15°C, Bunsen Coefficient =**

**DISTRIBUTION:** 0.02501

### **FIRE OR EXPLOSION HAZARD**

<b>CONDITIONS OF FLAMMABILITY:</b>	Flammable in air over a very wide range
<b>MEANS OF EXTINCTION:</b>	Water, carbon dioxide, dry chemical. "Stop flow of gas before extinguishing fire".
<b>FLASHPOINT AND METHOD OF DETERMINATION:</b>	Not applicable (gas)
<b>UPPER EXPLOSION LIMIT (% BY VOL):</b>	74.0
<b>LOWER EXPLOSION LIMIT (% BY VOL):</b>	12.5
<b>AUTO-IGNITION TEMPERATURE:</b>	630°C
<b>FLAMMABILITY CLASSIFICATION:</b>	Class 1, Group C
<b>HAZARDOUS COMBUSTION PRODUCTS:</b>	None
<b>EXPLOSION DATA:</b>	Reacts violently with strong oxidizers (oxygen difluoride barium peroxide, etc.)
<b>SENSITIVITY TO STATIC DISCHARGE:</b>	Unknown

### **REACTIVITY DATA**

<b>CHEMICAL STABILITY:</b>	Stable with respect to decomposition.
<b>INCOMPATIBLE MATERIALS:</b>	Oxidizers
<b>CONDITIONS OF REACTIVITY:</b>	Reacts at elevated temperatures to reduce metal oxides, metals and metal carbides.
<b>HAZARDOUS DECOMPOSITION PRODUCTS:</b>	None

### **TOXICOLOGICAL PROPERTIES**

#### **ROUTES OF ENTRY:**

**SKIN CONTACT:** None

**SKIN ABSORPTION:** None

**EYE:** None

**INHALATION:** Depending on levels and duration of exposure, symptoms may range from headache, dizziness, heart palpitations, weakness, confusion and nausea to convulsions, eventual unconsciousness and death.

Because it is a colorless and odorless poisonous gas, there is no warning of its presence other than the above symptoms. Analytical monitors, with alarms, should be employed where the possibility of the release of toxic quantities exists.

**INGESTION:** None

**ACUTE OVER EXPOSURE EFFECTS:** The oxygen transport function of the hemoglobin of the blood is reduced since it reacts with inhaled carbon monoxide to form carboxy hemoglobin instead of its normal reaction with the oxygen in the lungs to form oxhemoglobin. The affinity of hemoglobin for carbon monoxide is 200-300 times greater than its affinity for oxygen.

All of the disorders are due to the markedly reduced cellular respiration and may include central nervous systems impairment, cardiovascular collapse, renal insufficiency, coma, etc.

**CHRONIC OVER EXPOSURE EFFECTS:** None known

**EXPOSURE LIMITS:** TWA = 25 molar ppm; (ACGIH 1995-1996)

**IRRITANCY OF PRODUCT:** None

**SENSITIZATION TO MATERIAL:** None

**CARCINOGENICITY, REPRODUCTIVE EFFECTS:** Yes, in animals

**TERATOGENICITY, MUTAGENICITY:** Yes, in animals

**TOXICOLOGICALLY SYNERGISTIC PRODUCTS:** None

<b>PREVENTIVE MEASURES</b>
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**PERSONAL PROTECTIVE EQUIPMENT:** Plastic or rubber gloves. Safety goggles or glasses. Safety shoes, safety shower.

**SPECIFIC ENGINEERING CONTROLS:** Carbon monoxide can be handled in all commonly used metals up to approximately 3450 kPa. Above that pressure it

forms toxic and corrosive carbonyl compounds with some metals. Consult Liquid Air's Gas Encyclopedia for information on metals to use with high pressure carbon monoxide.

**LEAK AND SPILL PROCEDURES:** EVACUATE ALL PERSONNEL FROM AFFECTED AREA.

Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is on container or container valve, contact the closest MEGS location.

**WASTE DISPOSAL:** Do not attempt to dispose of waste or unused quantities. Return in the shipping container properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place to MEGS for proper disposal. For emergency disposal, contact the closest MEGS location.

**HANDLING PROCEDURES AND EQUIPMENT:** USE ONLY IN WELL-VENTILATED AREAS.

Valve protection caps must remain in place unless container is secured with valve outlet piped to the point of use. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure piping or systems. Do not heat cylinder by any means to increase the discharge rate of product from the cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Do not tamper with (valve) safety device. Close valve after use and when empty.

**STORAGE REQUIREMENTS:** Protect cylinders from physical damage. Store in cool, dry, well-ventilated area of non combustible construction away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 52°C. Cylinders must be stored upright and firmly secured to prevent falling or being knocked over. Full and empty cylinders should be segregated. Use a "first in - first out" inventory system to prevent full cylinders being stored for excessive periods of time. Post "No Smoking or Open Flames" signs in the storage or use area. There should be no sources of ignition in the storage or use area.

**TDG CLASSIFICATION:** 2,3 (2.1)

**WHMIS CLASSIFICATION:** A, D1, B

**SPECIAL SHIPPING INFORMATION:** Always secure cylinders in an upright position before transporting them. NEVER transport cylinders in trunks of vehicles, enclosed vans, truck cabs or in passenger compartments. Transport cylinders secured in open flatbed or in open pick-up type vehicles.

## FIRST AID MEASURES

**SPECIFIC FIRST AID PROCEDURES:** PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO CARBON MONOXIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS AND BE COGNIZANT OF EXTREME FIRE AND EXPLOSION HAZARD.

**INHALATION:** Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be moved to an uncontaminated area, given artificial respiration and oxygen at the same time. The administering of the oxygen at an elevated pressure (up to 2 - 2.5 atmospheres) has shown to be beneficial as has treatment in a hyperbaric chamber. The physician should be informed that the patient has inhaled toxic quantities of carbon monoxide.

**EYE CONTACT:** Not applicable

**SKIN CONTACT:** Not applicable

## PREPARATION INFORMATION

**PREPARED BY:** Safety Department

**DATE PREPARED:** 01/01/1999

**LAST REVISION DATE:** 02/01/2009

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