

MATERIAL
SAFETY
DATA SHEET

PRODUCT NAME Carbon Monoxide	CAS# 630-08-0
TRADE NAME AND SYNONYMS Carbon Monoxide	DOT I.D. NO. UN 1016
CHEMICAL NAME AND SYNONYMS Carbon Monoxide	DOT HAZARD CLASS Division 2.3
ISSUE DATE AND REVISIONS Revised January 2007	FORMULA CO
	CHEMICAL FAMILY Nonmetal Oxide

HEALTH HAZARD DATA

<p>SYMPTOMS OF EXPOSURE</p> <p>Depending on levels and duration of exposure, symptoms may include headache, dizziness, heart palpitations, weakness, confusion and nausea to convulsions, eventual unconsciousness and death.</p> <p>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 when the possibility of the release of toxic quantities exists.</p>
<p>TOXICOLOGICAL PROPERTIES</p> <p>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 oxyhemoglobin. The affinity of hemoglobin for carbon monoxide is 200-300 times greater than its affinity for oxygen.</p> <p>All the disorders are due to the markedly reduced cellular respiration and may include central nervous system impairment, cardiovascular collapse, renal insufficiency, coma, etc.</p> <p>Carbon Monoxide is not listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.</p> <p>Persons in ill health where such illness would be aggravated by exposure to Carbon Monoxide should not be allowed to work with or handle this product.</p>
<p>RECOMMENDED FIRST AID TREATMENT</p> <p>PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO CARBON MONOXIDE. RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.</p> <p><u>Inhalation:</u> 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 assisted respiration and supplemental oxygen. Further treatment should be symptomatic and supportive.</p>

Carbon Monoxide is flammable in air over a very wide range. It reacts violently with oxygen difluoride and barium peroxide.

PHYSICAL DATA

BOILING POINT -312.7 °F (-191.5 °C)	LIQUID DENSITY AT BOILING POINT 49.5 lb/ft ³ (793 kg/m ³)
VAPOR PRESSURE (21.1 °C) Above the critical temp. of -220.4°F(-140.2 °C)	GAS DENSITY AT 70 °F . 1 atm .072 lb/ft ³ (1.15 kg/m ³)
SOLUBILITY IN WATER Very Slightly	FREEZING POINT -337.1 °F (-205.1 °C)
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70 °F (21.1°C) = 0.96
APPEARANCE AND ODOR Colorless, odorless gas	

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method used) N/A (Gas)	AUTO IGNITION TEMPERATURE 1166 °F (630 °C)	FLAMMABLE LIMITS % BY VOLUME LEL 12.5 UEL 74.0
EXTINGUISHING MEDIA Water, dry chemical, carbon dioxide		ELECTRICAL CLASSIFICATION Class 1, Group C
SPECIAL FIRE FIGHTING PROCEDURES If possible, stop the flow of carbon monoxide. Use water spray to cool surrounding containers.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Carbon Monoxide has almost the same density as air. It will not diffuse by rising as with some lighter flammables such as hydrogen or natural gas (methane).		

REACTIVITY DATA

STABILITY		CONDITIONS TO AVOID
Unstable		N/A
Stable	X	
INCOMPATIBILITY (Materials to avoid)		Oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS		None
HAZARDOUS POLYMERIZATION		CONDITIONS TO AVOID
May Occur		N/A
Will Not Occur	X	

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.	
VENTILATION Hood with forced ventilation	SPECIAL N/A
MECHANICAL (Gen.) In accordance with electrical codes	OTHER N/A
LOCAL EXHAUST To prevent accumulation above the TWA.	
PROTECTIVE GLOVES Any material	
EYE PROTECTION Safety goggles or glasses	
OTHER PROTECTIVE EQUIPMENT Safety shoes, safety showers	

SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in container or container valve, contact HSG for special advice.

WASTE DISPOSAL METHOD

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 your supplier. For emergency disposal assistance, contact HSG for special advice.

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name: Carbon Monoxide
DOT Shipping Label: Poison Gas, Flammable Gas

DOT Hazard Class: Division 2.3
I.D. No.: UN 1016

SPECIAL HANDLING RECOMMENDATIONS

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. 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 (<2,000 psig) 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.

SPECIAL STORAGE RECOMMENDATIONS

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125°F (52°C). Cylinders should 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.

SPECIAL PACKING RECOMMENDATIONS

Carbon monoxide can be handled in all commonly used metals up to approximately 500 psig (3450 kPa). Above that pressure it forms toxic and corrosive carbonyl compounds with some metals. Carbon steels, aluminum alloys, copper and copper alloys, low carbon stainless steels and nickel-based alloys are recommended for higher pressure applications.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Earth-ground and bond all lines and equipment associated with the carbon monoxide system. Electrical equipment should be non-sparking or explosion proof. Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder which has not been filled by the owner or with his (written) consent is a violation of Law.

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