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**MATERIAL SAFETY DATA SHEET**

No. 163

<b>PRODUCT NAME</b> 30% Carbon Dioxide in Oxygen	<b>CAS #</b> Carbon Dioxide = 124-3v-9 Oxygen = 7782- 44- 7
<b>TRADE NAME AND SYNONYMS</b> Carbon dioxide and oxygen mixture (D.O.T.)	<b>DOT I.D. No.:</b> UN 1014
<b>CHEMICAL NAME AND SYNONYMS</b> 30 Molar % Carbon Dioxide in Oxygen	<b>DOT Hazard Class:</b> Division 2.2
<b>ISSUE DATES AND REVISIONS</b> January 1997	<b>Formula</b> 30 Molar % CO <sub>2</sub> in O <sub>2</sub> <b>Chemical Family:</b> Gas Mixture

**HEALTH HAZARD DATA**

<b>TIME WEIGHTED AVERAGE EXPOSURE LIMIT</b> Carbon dioxide TWA= 5,000 Molar PPM; STEL = 30.000 Molar PPM (ACGIH 1996). OSHA 1995 PEL (8 Hr. TWA) for CO <sub>2</sub> = 5,000 PPM.
<b>SYMPTOMS OF EXPOSURE</b> Breathing air mixtures with high oxygen concentrations causes symptoms of hyperoxia which include Cramps, nausea, dizziness, hypothermia, amblyopia, respiratory difficulties, bradycardia, fainting spells and convulsions capable of leading to death. For additional data on hyperoxia, refer to Compressed Gas Association's Pamphlet P-14. The carbon dioxide present in the mixture should cause the respiration rate to be increased
<b>TOXICOLOGICAL PROPERTIES</b> The property is that of hyperoxia which leads to pneumonia. Concentrations of oxygen which are greater than 25 Molar % present a risk of inflammation of organic matter in the body.  Neither carbon dioxide or oxygen are listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen.  Persons in ill health where such illness would be aggravated by exposure to this mixture should not be allowed to workwith or handle this product.
<b>RECOMMENDED FIRST AID TREATMENT</b> PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO THIS MIXTURE. RESCUE PERSONNEL SHOULD BE COGNIZANT OF EXTREME FIRE HAZARD ASSOCIATED WITH OXYGENRICH ATMOSPHERES.

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**HAZARDOUS MIXTURES OF OTHER LIQUIDS, SOLIDS, OR GASES**

This oxygen-rich mixture will vigorously accelerate combustion. Contact with all flammable material should be avoided. Some materials which are not flammable in air will burn in oxygen-enriched atmospheres.

**PHYSICAL DATA**

BOILING POINT See Page 4	LIQUID DENSITY AT BOILING POINT See Page 4
VAPOR PRESSURE See Page 4	GAS DENSITY AT 70°F, 1 atm .09219 lb/ft <sup>3</sup> (1.476kg/m <sup>3</sup> )
SOLUBILITY IN WATER CO <sub>2</sub> = Very soluble O <sub>2</sub> = Slightly soluble	FREEZING POINT See Page 4
EVAPORATION RATE N/A (Gas)	SPECIFIC GRAVITY (AIR=1) @ 70°F (21.1°C) = 1.23
APPEARANCE AND ODOR Colorless, odorless gas	

**FIRE AND EXPLOSION HAZARD DATA**

FLASH POINT (Method used) N/A	AUTO IGNITION TEMPERATURE N/A	FLAMMABLE LIMITS % BY VOLUME (See Page 4) LE N/A UEL N/A
EXTINGUISHING MEDIA Copious quantities of water for fires with oxygen as the oxidizer.		ELECTRICAL CLASSIFICATION Nonhazardous
SPECIAL FIRE FIGHTING PROCEDURES If possible, stop the flow of the gas mixture which is supporting the fire. If cylinders are involved in a fire, safely relocate or keep cool with water spray.		
UNUSUAL FIRE AND EXPLOSION HAZARDS Vigorously accelerates combustion		

**REACTIVITY DATA**

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

**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 user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. If leak is in container or container valve, contact your closest supplier location or call the emergency telephone number listed herein.
WASTE DISPOSAL METHOD Do not attempt to dispose of waste or unused quantities. Return in the shipping container <u>properly labeled, with any valve outlet plugs or caps secured and valve protection cap in place</u> to your supplier. For emergency disposal assistance, contact your closest supplier location or call the emergency telephone number listed herein.

**SPECIAL PROTECTION INFORMATION**

RESPIRATORY PROTECTION (Specify type) N/A			
VENTILATION See Local Exhaust	LOCAL EXHAUST See Page 4	SPECIAL	N/A
	MECHANICAL (Gen.) N/A	OTHER	N/A
PROTECTIVE GLOVES As required; any material			
EYE PROTECTION Safety goggles or glasses			
OTHER PROTECTIVE EQUIPMENT Safety shoes, safety shower			

**SPECIAL PRECAUTIONS\***

SPECIAL LABELING INFORMATION	
DOT Shipping Name: Carbon dioxide and oxygen mixture	DOT Hazard Class: Division 2.2
DOT Shipping Labels: Nonflammable Gas; Oxidizer	I.D. No.: UN 1014
SPECIAL HANDLING RECOMMENDATIONS	
Use only in well-ventilated areas. Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide or roll cylinder. Use a suitable hand truck for cylinder movement. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3,000 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 and away from full or empty stored, cylinders which contain flammable products. Do not allow the temperature where cylinders are stored to exceed 125F (52c). 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 PACKAGING RECOMMENDATIONS	
Carbon steels and low alloy steels are acceptable for use at lower pressures. For high pressure applications use stainless steels, copper, and its alloys, nickel and its alloys, brass, bronze, silicon alloys, Monel <sup>®</sup> Inconel <sup>®</sup> beryllium. Lead and silver or lead and tin, alloys are good gasketing materials. Teflon <sup>®</sup> and Kel-F <sup>®</sup> are the preferred non-metal gaskets.	
OTHER RECOMMENDATIONS OR PRECAUTIONS	
Equipment to contain high oxygen content mixtures must be "cleaned for oxygen service". See Compressed Gas Association Pamphlet G-4.1. 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 Federal Law (49CFR).	
(Continued on Page 4)	

\*Various Government Agencies (i.e. Department of Transportation, Occupational Safety and Health Administration, Food and Drug Administration and others) may have specific regulations concerning the transportation, handling, storage or use of this product which will not be reflected in this data sheet. The customer should review these regulations to ensure that he is in full compliance.

# ACETYLENE

## HEALTH HAZARD DATA

!TIME WEIGHTED AVERAGE EXPOSURE LIMIT (Continued)  
ACGIH and OSHA have no listing for oxygen.

## PHYSICAL DATA

Boiling Point: CO<sub>2</sub> Sublimation Point = -109.3° F (-78.5°C)  
O<sub>2</sub> = -297.3° F (-182.9°C)

LIQUID DENSITY AT BOILING POINT: CO<sub>2</sub> Solid Density = 97.5 lb/ft<sup>3</sup> (1562 kg/m<sup>3</sup>)  
O<sub>2</sub> = 71.23 lb/ft<sup>3</sup> (1141 kg/m<sup>3</sup>)

VAPOR PRESSURE: CO<sub>2</sub> @70°F (21.1°C) = 856 psia (5900 kPa)  
O<sub>2</sub> @70°F (21.1°C) = Above the critical temperature of:  
-181.1°F (-118.4°C)

FREEZING POINT: CO<sub>2</sub> = -69.8°F (-56.6°C) @ 75.1 psia (518 kPa)  
O<sub>2</sub> = -361.8°F (-218.8°C)

## SPECIAL PROTECTION INFORMATION

### LOCAL EXHAUST:

To prevent accumulation above 25 molar percent oxygen or above the TWA for carbon dioxide.

### SPECIAL PRECAUTIONS

#### OTHER RECOMMENDATIONS OR PRECAUTIONS: (Continued)

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.

Reporting under SARA, Title III, Section 313 not required.

NFPA No. for these mixtures = 1 0 0 0X