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MATERIAL SAFETY DATA SHEET

No. 165

PRODUCT NAME 40% Carbon Dioxide and 30% Oxygen in Nitrogen	CAS # CO ₂ = 124-38-9 O ₂ =7782-44-7 N ₂ = 7727-37-9
TRADE NAME AND SYNONYMS Compressed gas, oxidizing, n.o.s. (D.O.T.)	DOT I.D. No.: UN 3156
CHEMICAL NAME AND SYNONYMS 40 Molar% Carbon Dioxide and 30 Molar% Oxygen	DOT Hazard Class: Division 2.2
ISSUE DATES AND REVISIONS January 1997	Formula 40 Molar% CO ₂ and 30 Molar% O ₂ in N ₂ Chemical Family: Gas Mixture

HEALTH HAZARD DATA

<p>TIME WEIGHTED AVERAGE EXPOSURE LIMIT Carbon dioxide TWA = 5,000 Molar PPM and its STEL is 30,000 Molar PPM (ACCIH 1996). OSHA 1995 PEL(8Hr. TWA) for carbon dioxide = 5,000 Molar PPM. (Continued on Page 4)</p>
<p>SYMPTOMS OF EXPOSURE Inhaling this mixture will cause an increase in the respiration rate. Continuous inhalation will cause headache, nausea and eventual unconsciousness. The "higher than air" oxygen concentration in this mixture could cause symptoms of hyperoxia, however the symptoms of the carbon dioxide exposure should override these symptoms since they will occur more rapidly.</p>
<p>TOXICOLOGICAL PROPERTIES Carbon dioxide is the most powerful cerebral vasodilator known. Inhaling large concentrations causes rapid circulatory insufficiency leading to coma and death.</p> <p>Neither carbon dioxide, oxygen or nitrogen are 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 this mixture should not be allowed to work with or handle this product.</p>
<p>RECOMMENDED FIRST AID TREATMENT 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.</p> <p>Conscious persons should be assisted to an uncontaminated area and breathe fresh, air. They should be kept warm and quiet. The physician should be informed that the victim is experiencing (had experienced) hyperoxia.</p> <p>Unconscious persons should be moved to an uncontaminated area and given assisted respiration. When breathing has been restored, treatment should be as above. Continued treatment should be symptomatic and supportive.</p>

Information contained in this material safety data sheet is offered without charge for use by technically qualified personnel at their discretion and risk. All statements, technical information and recommendations contained herein are based on tests and data which we believe to be reliable, but the accuracy or completeness thereof is not guaranteed and no warranty of any kind is made with respect thereto. This information is not intended as a license to operate under or a recommendation to practice or infringe any patent of this Company or others covering any process, composition of matter or use. Since the Company shall have no control of the use of the product described herein, the Company assumes no liability for loss or damage incurred from the proper or improper use of such product.

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 .09223 lb/ft ³ (1.4774 kg/m ³)
SOLUBILITY IN WATER See Page 4	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) All flammable material		
HAZARDOUS DECOMPOSITION PRODUCTS Carbon monoxide		
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 the affected area. Use appropriate protective equipment. If leak is in user's equipment, 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 XX (Specify type)			
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: Compressed gas, Oxidizing, n.o.s. DOT Hazard Class: Division 2.2 DOT Shipping Labels: Nonflammable Gas; Oxidizer I.D.No.: UN 3156	
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 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. For additional storage recommendations, consult Compressed Gas Association's PamPhlets P-1, P-2, P-14, G-4, and G-6.	
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 [®] Inconel [®] beryllium. Lead and silver or lead and tin alloys are good gasketing materials. Teflon [®] and Kel-F [®] 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.

