MATERIAL SAFETY DATA SHEET

National Welders
P.O. Box 31007
Charlotte, NC 28231, 704-333-5475
Emergency Telephone: 800-866-4422
ChemTrec: 800-424-9300

MAJOR SUPPLIERS OF CRYOGENICS AND WELDING EQUIPMENT

MSDS # N0014002
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SECTION 1. MATERIAL IDENTIFICATION

Product Name
Oxygen

CAS # 7782-44-7

NFPA CODE 704/ HMIS

Health	0
Fire	0
Reactivity	0
Special Hazard	(OX)

Trade Name And Synonym
Oxygen; Oxygen, Compressed (D.O.T.)

DOT Identification No
UN-1072

Chemical Name And Synonyms
Oxygen

DOT Hazard Class
Division 2.2

Formula
O2

Chemical Family
Oxidizer

Description
Oxidant; Vital Element.

SECTION 2. HEALTH HAZARD INFORMATION

Time Weighted Average Exposure Limit
None established (ACGIH 1993-1994). Oxygen is the "vital element" in the atmosphere in which we live and breathe (approximately 21 Molar percent of the atmosphere). OSHA 1993 does not list a TWA for oxygen.

Symptoms Of Exposure
Breathing high concentrations (greater than 75 Molar percent) causes symptoms of hyperoxia which includes cramps, nausea, dizziness, hypothermia, amblyopia, respiratory difficulties, bradycardia, fainting spells, and convulsions capable of leading to death.

For additional information on hyperoxia, see Compressed Gas Association Pamphlet P-14.

Toxicological Properties
The property is that of hyperoxia which leads to pneumonia. Concentrations between 25 and 75 Molar percent present a risk of inflammation of organic matter in the body.

Oxygen is not 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 oxygen, should not be allowed to work with or handle this product.

Recommended First Aid Treatment
PROMPT MEDICAL ATTENTION IS MANDATORY IN ALL CASES OF OVEREXPOSURE TO OXYGEN. RESCUE PERSONNEL SHOULD BE COGNIZANT OF EXTREME FIRE HAZARD ASSOCIATED WITH OXYGEN RICH ATMOSPHERES.

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 (has experienced) hyperoxia.

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.

ECTION 3. PHYSICAL DATA

Boiling Point
297.3°F (-182.9°C)

Vapor Pressure @ 70° F (21.1°C)
(21.1°C) = Above the critical temperature of -181.1°F (-118.4°C)

Solubility In Water
Slightly

Evaporation Rate
N/A (Gas)

Appearance And Odor
Colorless, odorless gas

Liquid Density at Boiling Point
71.23 lb/ft3 (1141 kg/m3)

Gas Density at 70°F 1 ATM
0.828 lb/ft3 (1.326 kg/m3)

Freezing Point
-361.8°F (-218.8°C)

Specific Gravity (AIR = 1)
@ 70°F (21.1°C) = 1.11

SECTION 4. FIRE AND EXPLOSION HAZARD DATA

Flash Point
N/A

Auto Ignition Temperature
N/A

Flammable Units Percent by Volume
LEL N/A UEL N/A

Extinguishing Media
Copious quantities of water for fires with oxygen as the oxidizer.

Electrical Classification
Nonhazardous

Special Firefighting Procedure
If possible, stop the flow of oxygen which is supporting the fire.

Unusual Fire and Explosion Hazards
Vigorously accelerates combustion. If cylinders are involved in a fire, safely relocate or keep cool with water spray.

Hazardous Mixtures Of Other Liquids,Solids or Gases
Oxygen vigorously accelerates combustion. Contact with all flammable materials should be avoided. Some materials which are not flammable in air will burn in pure oxygen or oxygen-enriched atmospheres.

SECTION 5. REACTIVITY DATA

Stability
☐ Unstable
☑ Stable

Conditions To Avoid
None

Hazardous Polymerization
☐ May Occur
☑ Will Not Occur

Conditions To Avoid
None

Incompatibility; (Materials to Avoid)
All flammable materials.

Hazardous Decomposition Products
None

SECTION 6. SPILL, LEAK AND DISPOSAL 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
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 your closest supplier or call the emergency telephone number listed herein.

SECTION 7. SPECIAL PROTECTION INFORMATION

Respiratory Protection
N/A

Ventilation
See Local Exhaust

Local Exhaust
To prevent accumulation above 25 Molar percent.

Special
N/A

Mechanical
N/A

Other
N/A

Protective Gloves
As required, any material

Eye Protection
Safety goggles or glasses

Other Protective Equipment
Safety shoes, safety shower

SECTION 8. SPECIAL PRECAUTIONS AND COMMENTS

Special Labeling Information

DOT Shipping Name: Oxygen, Compressed
DOT Shipping Label: Nonflammable Gas; Oxidizer; OR: Oxygen (2)
DOT Hazard Class: Division 2.2
I.D. No.: UN-1072

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 cylinders. 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.

For additional handling recommendations, consult Compressed Gas Association Pamphlets P-1, P-14, and G-4.

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 from being stored for excessive periods of time.

For additional storage recommendations, consult Compressed Gas Association Pamphlets P-1, P-14, and G-4.

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®, or beryllium. Lead and silver or lead and tin alloys are good gasketing materials. Teflon® and Kel-F® are the preferred nonmetal gaskets.

SPECIAL NOTE: It should be recognized that the ignition temperature of metals and non-metals in pure oxygen service decreases with increased oxygen pressure.

Other Recommendations or Precautions

Oxygen should not be used as a substitute for compressed air in pneumatic equipment since this type generally contains flammable lubricants. Equipment to contain oxygen 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).

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 flatbeds or in open pickup type vehicles.

Special Notes

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