Oxygen
Material Safety
Data Sheet

BOGGS GASES

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EMERGENCY PHONE #: Chemtrec: 1-800-424-9300		Created: January 01, 2003 | Revised: January 01, 2007
MANUFACTURER'S NAME: BOGGS GASES 620 Main Street Titusville, FL 32796 Ph: (321) 267-4110 FAX: (321) 267-7171	**TRADE NAME AND SYNONYMS:** Oxygen, LOX (Liquid only), GOX (Gas Only) **FORMULA** O2 MW: 32.00	**CHEMICAL NAME AND SYNONYMS:** Oxygen **CHEMICAL FAMILY:** Oxidizing Gas CAS#7782-44-7

HEALTH HAZARD DATA

EXPOSURE LIMITS:
N/A. Oxygen is not listed as a carcinogen by NTP, IARC, or OSHA.

SYMPTOMS IF INGESTED, CONTACTED WITH SKIN, OR VAPOR INHALED:
Oxygen is nontoxic under most conditions of use and is necessary to support life. Liquid oxygen or cold gas will freeze tissues and can cause sever cryogenic (extremely low temperature) burns.

TOXICOLOGICAL PROPERTIES:
Oxygen is nontoxic under usual conditions of use. Breathing pure oxygen at one atmosphere, however, may produce cough and chest pains within 8-24 hours. Concentrations of 60% may produce these symptoms in several days. At two atmospheres symptoms occur in 2-3 hours. Partial pressure of oxygen in excess of two atmospheres may produce a variety of central nervous system manifestations including tingling of fingers and toes, visual and hearing disturbances, abnormal sensations, impaired coordination, confusion, muscle twitching, and seizures resembiling those of epilepsy. Sever hazards may be present when impaired judgement lead to operational errors. Infants exposed to oxygen levels in excess of 35-40% may suffer permanent visual impairment or blindness due to retrolental fibroplasia.

RECOMMENDED FIRST AID TREATMENT
If cryogenic liquid or cold boil-off gas contacts a worker's skin or eyes, frozen tissues should be flooded or soaked with tepid water (105-115F; 41-46C). DO NOT USE HOT WATER. Cryogenic burns which result in blistering or deeper tissue freezing should be seen promptly by a physician.

FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (Method Used)	AUTO IGNITION TEMP	FLAMMABLE LIMITS	LEL	UEL
N/A	N/A	Non-flammable	N/A	N/A

EXTINGUISHING MEDIA	ELECTRICAL CLASSIFICATION GROUP
N/A	N/A

SPECIAL FIRE FIGHTING PROCEDURES
Oxygen is nonflammable, but supports and VIGOROUSLY ACCELERATES COMBUSTION of flammables. To fight fires, shut off sources of oxygen and fight like conventional fire.

UNUSUAL FIRE AND EXPLOSION HAZARDS
Some materials which are noncombustible in air will burn in the presence of higher concentrations of oxygen.

PHYSICAL DATA

BOILING POINT (F)	FREEZING POINT (F)
1 atm -297.3F (-183.0C)	@ 1 atm -361.8F (-218.8C)

VAPOR PRESSURE (psia)	SOLUBILITY IN WATER	VAPOR DENSITY (lb/cu ft)
N/A	@ 77F (25C), 1 ATM 3.16% by volume	@ 68F (20C), 1 atm 0.08309
SPECIFIC GRAVITY (AIR=1)	**LIQUID DENSITY (lb/cu ft)**	**SPECIFIC GRAVITY (H20=1)**
@ 68F (20C), 1 atm 1.10	@ boiling point, 1 atm 71.21	@ boiling point, 1 atm 1.14

APPEARANCE AND ODOR
Gaseous oxygen is colorless and odorless. Liquid oxygen is pale blue and odorless.

REACTIVITY DATA

STABILITY	**UNSTABLE**		**CONDITIONS TO AVOID** Materials which burn in air will burn violently in atmosphere richer than ~25% oxygen. Some materials will burn in pure oxygen which are nonflammable in air.
	STABLE	X	

INCOMPATIBILITY (Materials to avoid)
All flammables, especially petroleum products, asphalt, or other volatile flammables.

HAZARDOUS DECOMPOSITION PRODUCTS
None

HAZARDOUS	**MAY OCCUR**		**CONDITIONS TO AVOID**
POLYMERIZATION	**WILL NOT OCCUR**	X	None

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SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Prevent liquid oxygen from contacting grease, oil, asphalt or combustibles. Ventilate area to evaporate and disperse oxygen. Flush area with large quantities of water. DO NOT ENTER areas of high oxygen concentration, which can saturate clothing and increase its flammability. Avoid smoking and contact with sources of ignition after exposure to concentration of oxygen higher than the normal atmosphere.

WASTE DISPOSAL METHOD

Allow liquid oxygen to evaporate in a well ventilated outdoor area. Vent oxygen gas to outside location. Diposal site should be remote from work areas, open flames or sources of ignition and combustibles. Water flushing increases vaporization rate. Return cylinders to Boggs Gases with residual pressure, the cylinder valve tightly closed and valve caps in place.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type)

N/A

VENTILATION	**LOCAL EXHAUST** As Necessary	**SPECIAL** Only As Necessary
Prevent accumulation with natural air	**MECHANICAL (General)** As Necessary	**OTHER** Vents should be situated to avoid higher than normal concentration of oxygen in work areas.

PROTECTIVE GLOVES

(LOX) Loose-fitting gloves of impermeable materials such as leather. Leather work gloves are recommended when handling compressed gas cylinders.

EYE PROTECTION

(LOX) Chemical goggles or safety glasses. Safety glasses are recommended when handling high-pressure cylinders.

OTHER PROTECTIVE EQUIPMENT

None

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name: Oxygen; (LOX) Oxygen, refrigerated liquid.
DOT Hazard Class: Nonflammable Gas
DOT Shipping Label: Oxidizer
I.D. Number: UN 1072; UN 1073 (LOX)

SPECIAL HANDLING RECOMMENDATIONS

Prevent contact of liquid oxygen or cold boil-off gas with exposed skin. Prevent entrapment of liquid in closed systems. Use only in well ventilated areas. Compatability and cleanliness of materials in contact with oxygen are essential especially internal parts of piping systems. Some elastomers (o-rings, valve seats, etc.) are not compatible with oxygen. Open oxygen valves slowly. Compressed gas cylinders contain oxygen at extremely high pressure and should be handled with care. Use a pressure-reducing regulator and pressure relief devices when connecting to lower pressure piping systems. Secure cylinders when in use. Never use a direct flame to heat a compressed gas cylinder. Use a check valve to prevent lack flow into a storge container. Avoid dragging, rolling or sliding cylinders, even for a short distance. Use a suitable hand truck. For additional handling recommendations on compressed gas cylinders, consult Compressed Gas Association Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS

It is recommended that liquid cylinders be stored outside and the gas or liquid piped to the use point. However, if liquid cylinders are to be stored or transported in an enclosed area, it is essential that the area be well ventilated. In case of poor ventilation, forced ventilation should be installed. Keep cylinders away from sources of heat. Storage should not be in heavy traffic areas to prevent accidental knocking over or damage from passing or falling objects. Valve caps should remain on cylinders not connected for use. Segregate full and empty cylinders. Storage areas should be free of combustible material. Replace the cylinder cap when the cylinder is not in use. Avoid exposure to areas where salt or other corrosive chemicals are present. See CGA Pamphlet P-1.

OTHER RECOMMENDATIONS OR PRECAUTIONS

Oxygen is not to be used as a substitute for compressed air. Applications such as cleaning, dusting, powering pneumatic tools, tec., are not safe due to lubricating oils and other materials present. Use only with equipment specifically designed and cleaned for oxygen service. Consult Compressed Gas Association Pamphlt G-4.1, "Cleaning Equipment for Oxygen Service," for details. Liquid Oxygen is cryogenic liquid. Materials of construction must be selected for compatibility with extremely low temperatures. Avoid using carbon steel and other materials which become brittle at low temperatures, Compressed gas cylinders should not be refilled except by qualified producers of compressed gases. Shipment of a compressed gas cylinder filled without the permission of the owner is a violation of Federal Law. If oxygen concentrations exceeding 25% are suspected or can occur, use oxygen monitoring equipment to test for oxygen-enriched atmospheres.

* 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 s/he is in full compliance.