

**1. PRODUCT AND COMPANY IDENTIFICATION**

**PRODUCT NAME:** Oxygen, compressed  
**CHEMICAL NAME:** Oxygen  
**CHEMICAL FAMILY:** Oxidizer  
**SYNONYMS:** Oxygen USP, Aviators Breathing Oxygen (ABO)  
**CHEMICAL FORMULA:** O<sub>2</sub>  
**USE:** Various

**NAME AND ADDRESS:** **Refrigeration & Oxygen Co.**  
**Corporate Office**  
 Area No 1, Block 21 C,  
 Central Slaughter House Street  
 Shuwaikh Industrial Area  
 Kuwait.

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**2. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW:**

**WARNING!** Odorless, colorless high pressure oxidizing gas.  
 Vigorously accelerates combustion.

**POTENTIAL HEALTH EFFECTS INFORMATION:****ROUTES OF EXPOSURE:**

**INHALATION:** Simple Asphyxiant.

It should be noted that before suffocation could occur, the lower flammability limit of Oxygen in air would be exceeded; possibly causing both an explosive and an oxygen-deficient atmosphere. Exposure to moderate concentrations may cause dizziness, headache, and unconsciousness. Lack of sufficient oxygen may cause serious injury or death.

**EYE CONTACT:** None

**SKIN CONTACT:** None

**SKIN ABSORPTION:** None

**INGESTION:** None

**CHRONIC EFFECTS:** None

**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** None

**OTHER EFFECTS OF OVEREXPOSURE:** None

**CARCINOGENICITY:** Acetylene is not listed by NTP, OSHA, or IARC.

**POTENTIAL ENVIRONMENTAL EFFECTS:** No adverse ecological effects are expected.

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

**INGREDIENT NAME** OXYGEN

**PERCENTAGE** >99%

**CAS NUMBER** 1333-74-0

#### 4. FIRST AID MEASURES

**FIRST AID PROCEDURES:**

**INHALATION:** Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Obtain prompt medical attention.

**EYE CONTACT:** None

**SKIN CONTACT:** Not applicable

**INGESTION:** Not applicable

**NOTES TO PHYSICIAN:** None

#### 5. FIREFIGHTING MEASURES

**FLAMMABLE PROPERTIES:** Can form explosive mixtures with air. Burns with a pale blue, nearly invisible flame..

**EXTINGUISHING MEDIA:** Carbon Dioxide, Dry Chemical, Water

**PROTECTION OF FIREFIGHTERS:**

**SPECIFIC HAZARDS ARISING FROM THE CHEMICAL:** Oxygen is easily ignited with low ignition energy. Oxygen is lighter than air and can accumulate in the upper sections of enclosed spaces. Pressure in a container can build up due to heat, and it may rupture if pressure relief devices should fail to function.

**PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIREFIGHTERS:** Evacuate all personnel from danger area. Immediately cool container with water spray from maximum distance, taking care not to extinguish flames. If flames are accidentally extinguished, explosive re-ignition may occur. Stop flow of gas if without risk while continuing cooling water spray.

**SENSITIVITY TO STATIC DISCHARGE:** Ignitable by static electricity

**SENSITIVITY TO MECHANICAL IMPACT:** None

#### 6. ACCIDENTAL RELEASE MEASURES

**PERSONAL PRECAUTIONS:** Use personal protection recommended in Section 8. Before entering area you must check for flammable and oxygen-deficient atmospheres. Evacuate immediate area. Eliminate any possible sources of ignition, and provide maximum explosion-proof ventilation. If leaking from cylinder, or valve, contact your supplier. The presence of a Oxygen flame can be detected by approaching cautiously with an outstretched straw broom to make the flame visible. Never enter a confined space or other area where the concentration is greater than 10% of the lower flammable limit, which is 0.4%.

**ENVIRONMENTAL PRECAUTIONS:** Not applicable.

**METHODS FOR CONTAINMENT:** Shut off source of Oxygen, if possible.

**METHODS FOR CLEAN-UP:** Not applicable.

**OTHER INFORMATION:** None.

#### 7. HANDLING AND STORAGE

**HANDLING:** Use a suitable hand truck for cylinder movement. Do not "crack" Oxygen cylinder valve before connecting it, since self-ignition may occur. Oxygen is the lightest gas known and may collect in the top of buildings without proper ventilation. It may leak out of a system that is gas-tight for air or other gases. Leak check system with leak detection solution, never with flame. If user experiences difficulty operating cylinder valve, discontinue use and contact supplier. Never insert an object (e.g., wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing a leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Non sparking tools should be used. For additional precautions in using Oxygen see Section 16, Other Information.

**STORAGE:** Specific requirements are listed in NFPA 55. Compressed gas cylinders shall be separated from materials and conditions that present exposure hazards to or from each other. Cylinder storage locations should be well-protected, well-ventilated, dry, and separated from combustible materials. Cylinders should never knowingly be allowed to reach a temperature exceeding 125 of (52°C). Cylinders of Oxygen should be separated from oxygen cylinders or other oxidizers by a minimum distance of 20 ft, or by a barrier of noncombustible material at least 5 ft high having a fire resistance rating of at least 1/2 hour. Full and empty cylinders should be segregated. Use a first-in, first-out inventory system to prevent full containers from being stored for long periods of time.

Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling or being knocked over. Protect cylinders from physical damage; do not drag, roll, slide or drop. Post "No Smoking or Open Flames" signs in the storage areas. There should be no sources of ignition. All electrical equipment should be explosion proof in the storage and use areas. Storage areas must meet national electric codes for Class 1 hazardous areas.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### EXPOSURE GUIDELINES:

OSHA PEL-TWA: None

NIOSH IDLH: None

ACGIH TLV: Simple asphyxiant.

### ENGINEERING CONTROLS:

**VENTILATION:** Provide natural or explosion-proof ventilation adequate to ensure Oxygen does not reach its lower explosive limit of 4.0%.

### PERSONAL PROTECTIVE EQUIPMENT:

**EYE/FACE PROTECTION:** Safety glasses are recommended when handling cylinders.

**SKIN PROTECTION:** Work gloves are recommended when handling cylinders. Safety shoes are recommended when handling cylinders. Cotton clothing is recommended for use to prevent static electric buildup.

### RESPIRATORY PROTECTION:

General Use: None required

Emergency Use: Air supplied respirators are required in oxygen-deficient atmospheres (air purifying respirators will not function). Before entering area you must check for flammable and oxygen-deficient atmospheres.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless

ODOR: Oxygen is odorless and tasteless at NTP.

ODOR THRESHOLD: Not applicable

PHYSICAL STATE: Gaseous

pH: Not applicable

MELTING POINT: -434.55 °F (-259.2 °C) @ 1 atm

BOILING POINT (1 ATM): -423.0 °F (-252.8 °C)

FLASH POINT: Gas, not applicable

EVAPORATION RATE (Butyl Acetate=1): Not applicable

FLAMMABILITY: Flammable gas

FLAMMABLE LIMITS IN AIR BY VOLUME:

LOWER: 4.0%

UPPER: 75.0%

VAPOR PRESSURE (AT 20°C): Not applicable

GAS DENSITY: 0.00521 lb/ft<sup>3</sup> (0.08342 kg/m<sup>3</sup>) @ 70 °F (21.1 °C) and 1 atm SPECIFIC

GRAVITY (Air =1): 0.06960 @ 32 °F (0 °C) and 1 atm

SOLUBILITY IN WATER: Vol/Vol at 60 °F (15.6 °C): 0.019

COEFFICIENT OF WATER/OIL DISTRIBUTION: Not available

AUTOIGNITION: 565.5 °C (1050 °F)

DECOMPOSITION TEMPERATURE: Not available

MOLECULAR WEIGHT: 2.016

EXPANSION RATIO: Not applicable (gas)

## 10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable.

CONDITIONS TO AVOID: None

INCOMPATIBLE MATERIALS: Oxidizing agents. Some steels are susceptible to Oxygen embrittlement at high pressures and temperatures.

HAZARDOUS DECOMPOSITION PRODUCTS: None

POSSIBILITY OF HAZARDOUS REACTIONS: Oxygen can react explosively when combined with oxygen and other oxidizers including all halogens and halogen compounds.

## 11. TOXICOLOGICAL INFORMATION

Acetylene is a simple asphyxiant.

ACUTE DOSE EFFECTS:

LD50: None; LC50: None

REPEATED DOSE EFFECTS: None Established

IRRITATION: None

GENETIC EFFECTS: None

DEVELOPMENTAL EFFECTS: None  
TERATOGENICITY: None  
SYNERGISTIC MATERIALS: None  
SENSITIZATION: None  
REPRODUCTIVE EFFECTS: None  
TARGET ORGAN EFFECTS: None  
MUTAGENICITY: None

## 12. ECOLOGICAL INFORMATION

ECOTOXICITY: No adverse ecological effects are expected. Acetylene does not contain any Class I or Class II ozone-depleting chemicals (40 CFR Part 82). Acetylene is not listed as a marine pollutant by DOT (49 CFR Part 171).

## 13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD: Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. Unserviceable cylinders should be returned to the supplier for safe and proper disposal.

Residual product within process system may be vented at a controlled rate to the atmosphere through a vent stack that discharges to an elevated point. This vent stack should be in an isolated area away from ignition sources.

## 14. TRANSPORT INFORMATION

Product Information Number: 1049

BASIC SHIPPING DESCRIPTION:

PROPER SHIPPING NAME: Oxygen, Compressed

HAZARD CLASS: 2.1 (Flammable gas)

IDENTIFICATION NUMBER: UN 1049

ADDITIONAL INFORMATION:

PRODUCT RQ: None

SHIPPING LABEL(s): Flammable gas

PLACARD (when required): Flammable gas

SPECIAL SHIPPING INFORMATION: Cylinders should be transported in a secure position. in a well ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles can present serious safety hazards and should be discouraged.

## 15. REGULATORY INFORMATION & OTHER INFORMATION

SPECIAL PRECAUTIONS: Use piping and equipment adequately designed to withstand pressures to be encountered. Use a check valve or other protective apparatus in any line or piping from the cylinder to prevent reverse flow. Cross contamination of gases, liquids, or both can also create a hazardous condition inside a cylinder, dewar, or vessel (e.g., flammable and oxidizing gases can create an explosive mixture), which may result in rupture.

MIXTURES: When two or more gases are mixed, their hazardous properties may combine to create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture.

HAZARD RATINGS AND RATING SYSTEMS:

**NFPA RATINGS:**

HEALTH: =0; FLAMMABILITY: =4; INSTABILITY: =0; SPECIAL: SA

**STANDARD VALVE CONNECTIONS:**

THREADED:

0-3000 psig	CGA350
3001-5500 psig	CGA695
5501-7500 psig	CGA 703

PIN-INDEXED YOKE: None

ULTRA HIGH INTEGRITY: None

Use the proper connections; DO NOT USE ADAPTERS, Do not force Fit adapters/ connections.

The information and recommendations in this Material Safety Data Sheet relate only to the specific material mentioned herein and do not relate to use otherwise ie., in combination with any other material or in any process.

The information and recommendations herein are taken from our extensive experiences and the data contained in recognized references and believed by us to be accurate. Refrigeration group of companies make no warranties either expressed or implied with respect there to and assume no liability in connection with the use of such information and recommendation.