Linde Gas

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MATERIAL SAFETY DATA SHEET

No. 173

PRODUCT NAME 19 - 30% Oxygen in Argon	**CAS #** 0_2 - 7782-44-7 Ar = 7440- 37- 1
TRADE NAME AND SYNONYMS Rare Gas and Oxygen Mixture, Compressed (D.0.T.)	**DOT I.D. No.:** UN 1980
CHEMICAL NAME AND SYNONYMS 19 - 30 Molar % Oxygen in Argon	**DOT Hazard Class:** Division 2.2
ISSUE DATES AND REVISIONS May 1998	**Formula** 19 - 30 Molar % O_2 in Ar
	Chemical Family: Gas Mixture

HEALTH HAZARD DATA

TIME WEIGHTED AVERAGE EXPOSURE LIMIT

No TWA is established for Oxygen; Arpon is a simple asphyxiant (ACGIH 1997). 0SHA 1995 PEL (8 hr. TWA) = no listing for 0xygen or Argon.

SYMPTOMS OF EXPOSURE

These mixtures should be considered similar to air.

TOXICOLOGICAL PROPERTIES

Neither oxygen or argon are listed in the IARC, NTP or by OSHA as a carcinogen or potential carcinogen .

Persons i n ill heal th where such illness would be aggravated by exposure to thest mixtures should not be allowed to work with or handle these products.

RECOMMENDED FIRST AID TREATMENT

None

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

Contact with all flammable material should be avoided. Some materials which are not flammable in air will burn in oxygen-rich atmospheres.

PHYSICAL DATA

BOILING POINT O2 = -297.3ºF (-182.9ºC) Ar = -302.6ºF (-185.9ºC)	**LIQUID DENSITY AT BOILING POINT** See Page 5
VAPOR PRESSURE See Page 5	**GAS DENSITY AT 70°F. 1 atm** See Page 5
SOLUBILITY IN WATER Very slightly	**FREEZING POINT** O_2 = -361 .8ºF (-218.8ºC) Ar = -308. 9ºF (-189. 4ºC)
EVAPORATION RATE N/A (Gas)	**SPECIFIC GRAVITY (AIR=1)** @ 70ºF (21.1ºC) = O_2 = 1.11; Ar = 1.38
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 rich atmospheres as the oxidizer		**ELECTRICAL CLASSIFICATION** Non hazardous
SPECIAL FIRE FIGHTING PROCEDURES If cylinders are involved in a fire, safely relocate or keep cool with water spra y.		
UNUSUAL FIRE AND EXPLOSION HAZARDS High oxygen content mixtures vigorously accelerate combustion.		

REACTIVITY DATA

STABILITY Unstable		**CONDITIONS TO AVOID** None
Stable	X	
INCOMPATIBILITY (Materials to avoid) None		
HAZARDOUS DECOMPOSITION PRODUCTS None		
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 a ffected area. Use appropriate protective equipment. If leak is in container or container valve, contact your closest supplier location or call the emerqency telephone number listed herein.

WASTE DISPOSAL METHOD

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 supplie r. For emergency disposal assistance, contact your Closest supplier location or call the emergency telephone listed herein.

SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION (Specify type) None		
VENTILATION See Local Exhaust	**LOCAL EXHAUST** To prevent oxygen accumulations above 25 Molar %	**SPECIAL** N/A
	MECHANICAL (Gen.)	**OTHER** N/A
PROTECTIVE GLOVES As required when welding. See Other Protective Equipment		
EYE PROTECTION Safety goggles or glasses. When welding; wear helmet or use face (Continued on Page 4)		
OTHER PROTECTIVE EQUIPMENT Safety shoes and appropriate head and eye protection when welding. (Continued on Page 4)		

SPECIAL PRECAUTIONS*

SPECIAL LABELING INFORMATION

DOT Shipping Name: Rare Gas and Oxygen Mixture, Compressed
DOT Hazard Class: Division 2.2
DOT Shipping Label: See Note on page 4.
I.D. No. UN 1980

SPECIAL HANDLING RECOMMENDATIONS

Use only in well-ventilated areas. Valve protection caps must remain in place unless container is secured with valve outlet piped to use point. Do not drag, slide, drop 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. Keep cylinder away from heat and flame. Do not tamper with (valve) safety device. Close valve after each use and when empty. See NFPA Pamphlet 51A “Welding and Cutting” for additional information.

For additional recommendations consult Compressed Gas Association’s Pamphlet P-1.

SPECIAL STORAGE RECOMMENDATIONS

Protect cylinders from physical damage. Store in cool, dry, well-ventilated area away from heavily trafficked areas and emergency exits. Do not allow the temperature where cylinders are stored to exceed 125ºF (52ºC). 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” inventoy system to prevent full cylinders being stored for excessive periods of time.

For additional recommednations consult Compressed Gas Assocation’s Pamphlet P-1.

SPECIAL PACKAGING RECOMMENDATIONS

Carbon steels and low alloy steels are acceptable for use at lower pressure. 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 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). 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. (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.

19 - 30% Oxygen in Argon

SPECIAL PROTECTION INFORMATION

EYE PROTECTION: - (Continued)

shield with filter lens. As a general rule, start with a shade which is too dark to see the weld zone. Then go to the next lighter shade which gives sufficient view of the weld zone. Provide protection screens and flash goggles, if necessary, to shield others from arc rays radiation which can injure eyes and burn skin.

OTHER PROTECTIVE EQUIPMENT: - (Continued)

When welding, wear head, hand and body protection which help to prevent injury from radiation, sparks and electrical shock. See ANSI Z-49.1. At a minimum, this includes welder's gloves and a protective face shield and may include arm protectors, aprons, hats, shoulder protection, as well as dark substantial clothing. Train the welder not to touch live electrical parts and to insulate himself from work and ground.

CAUTION: Welding or brazing may produce fumes and gases hazardous to health. Short-term (acute) overexposure to welding fumes may result in discomfort such as: dizziness, nausea, or dryness or irritation of nose, throat, or eyes. Long-term (chronic) overexposure may lead to siderosus (iron deposits in the lungs) and is believed by some investigators to affect pulmonary function. Arc rays can injure eyes and burn skin. Electric shock can kill. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z-49.1 "Safety in Welding and Cutting" published by the American Welding Society. Transport cylinders secured in open flatbed or in open pick-up vehicles.

Consult hazard warnings on boxes or containers (or on tags or labels thereon) containing brazing or welding filler metals, fluxes and fusible granular materials. See OSHA safety regulations under 29CFR 1910.252 "Welding, Cutting and Brazing." Also see ACGIH "TLVs (1997) for Chemical Substances in the Work Environmen3 " Appendix B, Section B2 "Welding Fumes" (Total Particulate TLV-TWA, 5 mg/m^3 for further information.

Consult manufacturer's material safety data sheet on welding consumables and related products for reactivity and health hazard data, and for further information regarding welding fumes.

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

NFPA 704 No. for these mixtures = 1 0 0 Ox

OTHER RECOMMENDATIONS OR PRECAUTIONS: - (Continued)

Transport cylinders secured in open flatbed or in open pick-up type vehicles.

DOT Shipping Label(s) Note: Requires Nonflammable Gas Label and if Oxygen content of mixture is above 23.5 Molar% also requires an Oxidizer Label.

PHYSICAL DATA -(Continued)

LIQUID DENSITY AT BOILING POINT:	O_2 = 71.23 LB/ft^3 (1141 kg/m^3) AR = 87 lb/ft^3 (1393 kg/m^3)
VAPOR PRESSURE: @ 70ºF (21.2ºC)	= Above the critical temperature of: 0_2 = -181.1ºF (-118.4ºC) Ar = -188.1ºF (-122.3ºC)
GAS DENSITY AT 70ºF, 1 atm:	O_2 = .0828 1b/ft^3 (1.326 kg/m^3) Ar = .1034 lb/ft^3 (1.656 kg/m^3)