Safety Data Sheet

SDS Oxygen (Refrigerated liquid)

Manufacturer/Importer/Distributor:
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1.- Product and Company Identification

Product name:
Oxygen

Chemical family[1]:
Oxidizing gases

Relevant :
Nonflammable gas
Oxidizing gas
Compressed gas

Chemical formula:
O_2

Product Use Description:
General Industrial.

2.- Hazards Identification

GHS classification:

Oxidizing gases - Category 1.
Gases under pressure – Refrigerated liquid.

GHS label elements:

Hazard pictograms/symbols

Signal Word: **“Danger”**

Hazard Statements:

H270: May cause or intensify fire: oxidizer.
H281: Contains refrigerated; may cause cryogenic burns or injury. Combustibles in contact with liquid oxygen may explode on ignition or impact.

Precautory Statements:

Prevention:

P220: Keep away from clothing and other combustible materials.
P244: Keep valves and fittings free from oil and grease**.**
P282: Wear cold insulating gloves/faces shield/eye protection.

Response:

P315: Get immediate medical advice/attention.
P336: Thaw frosted parts with lukewarm water. Do not rub affected area.
P370+P376: In case of fire: Stop leak if safe to do so.

Storage:

P403: Store in a well-ventilated place.

Hazards not otherwise classified:

- Extremely cold liquid and gas under pressure.
- Direct contact with liquid can cause frostbite.
- May react violently with combustible materials.
- Keep oil, grease, and combustibles away.

3.-Composition/Information on ingredients

Concentration (volume):	No. UN:	Sinonyms:	No. CAS[2]:
100%	1073	Oxygen (refrigerated), Oxygen USP, LOX, Cryogenic Liquid Oxygen	7782-44-7

Concentration is nominal. For the exact product composition, please refer to Infra technical specifications.

4.-First Aid Measures

General advice:	Remove victim to uncontaminated area wearing self-contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Eye contact:	In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Skin contact:	In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash frostbitten areas with plenty of water. Do not remove clothing. As soon as practical, place the affected area in a warm water bath- which has a temperature not to exceed 40 °C (105 °F). Cover wound with sterile dressing.
Ingestion:	Ingestion is not considered a potential route of exposure.
Inhalation:	Consult a physician after significant exposure. Move to fresh air. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.
Most important symptoms/effects - acuate and delayed:	If oxygen is administered to persons with chronic obstructive pulmonary disease, raising the oxygen concentration in the blood depresses their breathing and raises their retained carbon dioxide to a dangerous level. If oxygen is administered to persons with chronic obstructive pulmonary disease, raising the oxygen concentration in the blood depresses their breathing and raises their retained carbon dioxide to a dangerous level.

5.-Fire-Fighting Measures

Suitable extinguishing media:	The product itself does not burn. Use extinguishing media appropriate for surrounding fire.
Specific hazards:	Combustibles in contact with liquid oxygen may explode on ignition or impact. Some materials which are noncombustible in air may burn in the presence of an oxidizer. Contact with organic and most inorganic materials may cause fire. Vapor cloud may obscure visibility. Move away from container and cool with water from a protected position. Do not direct water spray at container vent. If possible, stop flow of product.
Further information	Some materials that are noncombustible in air will burn in the presence of an oxygen enriched atmosphere (greater than 23.5%). Fire resistant clothing may burn and offer no protection in oxygen rich atmospheres.

6.-Accidental release measures

Personal Precautions, Protective Equipment, and Emergency Procedures:	Clothing exposed to high concentrations may retain oxygen 30 minutes or longer and become a potential fire hazard. Stay away from ignition sources. Evacuate personnel to safe areas. Ventilate the area. Monitor oxygen level. Spill will rapidly vaporize forming an oxygen rich vapor cloud. Gas/vapor heavier than air. May accumulate in confined spaces, particularly at or below ground level. Personnel who have been exposed to high concentrations of oxygen should stay in a well-ventilated or open area for 30 minutes before going into a confined space or near an ignition source.
Environmental precautions:	Do not discharge into any place where its accumulation could be dangerous.
Methods for cleaning up:	Prevent further leakage or spillage if safe to do so. Ventilate the area.
Additional advice:	Increase ventilation to the release area and monitor oxygen level.

7.-Handling and Storage

Handling:

- All gauges, valves, regulators, piping and equipment to be used in oxygen service must be cleaned for oxygen service.
- Oxygen is not to be used as a substitute for compressed air.
- Never use an oxygen jet for cleaning purposes of any sort, especially clothing, as it increases the likelihood of an engulfing fire.
- Know and understand the properties and hazards of the product before use.
- Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label.
- Do not remove or deface labels provided by the supplier for the identification of the cylinder contents.
- Before connecting the container, check the complete gas system for suitability, particularly for pressure rating and materials.
- Before connecting the container for use, ensure that back feed from the system into the container is prevented.
- Close container valve after each use and when empty, even if still connected to equipment.
- Never attempt to repair or modify container valves or safety relief devices.
- Damaged valves should be reported immediately to the supplier.

- If user experiences any difficulty operating cylinder valve discontinue use and contact supplier.
- Do not remove or interchange connections.
- Prevent entrapment of cryogenic liquid in closed systems not protected with relief device.
- When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders.
- When doubt exists as to the correct handling procedure for a particular gas, contact the supplier.
- Employ suitable pressure regulating devices on all containers when the gas is being emitted to systems with lower pressure rating than that of the container.
- Do not subject containers to abnormal mechanical shock.
- Only transfer lines designed for cryogenic liquids shall be used.
- Use only with equipment cleaned for oxygen service and rated for cylinder pressure.
- Never permit oil, grease, or other readily combustible substances to come into contact with valves or containers containing oxygen or other oxidants.
- All vents should be piped to the exterior of the building.

Storage:

- Do not change or force fit connections. Always keep container in upright position.
- Use a back flow preventative device in the piping.
- Use only with equipment of compatible materials of construction, rated for cylinder pressure.
- Use only with equipment cleaned for oxygen service and rated for cylinder pressure.
- Do not walk on or roll equipment over spills.
- Open/close valve slowly.
- Close when not in use.
- Wear Safety Eye Protection.
- Check Safety Data Sheet before use.
- Containers should be stored in a purpose build compound which should be well ventilated, preferably in the open air.
- Do not allow storage temperature to exceed 50°C (122°F).
- Full containers should be stored so that oldest stock is used first.
- Do not store in a confined space.
- Full and empty cylinders should be segregated.
- Store containers in location free from fire risk and away from sources of heat and ignition.
- Return empty containers in a timely manner.
- Stored containers should be periodically checked for general condition and leakage.
- Protect containers stored in the open against rusting and extremes of weather.
- Containers should not be stored in conditions likely to encourage corrosion.
- Cryogenic containers are equipped with pressure relief devices to control internal pressure.
- Under normal conditions these containers will periodically vent product.
- Where necessary containers containing oxygen and oxidants should be separated from flammable gases by a fire resistant partition.

Technical measures/Precautions:

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) And in accordance whit local regulations.

8.-Exposure controls/Personal protection

Engineering measures:

Natural or mechanical to prevent oxygen-enriched atmospheres above 23.5% oxygen.

Personal protective equipment:

Respiratory protection: Users of breathing apparatus must be trained.

Hand protection: Wear working gloves when handling gas containers.
Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Eye protection: Safety glasses recommended when handling cylinders.
Wear goggles and a face shield when transfilling or breaking transfer connections.

Skin and body protection: Personnel who have been exposed to high concentrations of oxygen should stay in a well-ventilated or open area for 30 minutes before going into a confined space or near an ignition source.
Never allow any unprotected part of the body to touch uninsulated pipes or vessels which contain cryogenic fluids. The extremely cold metal will cause the flesh to stick fast and tear when one attempts to withdraw from it.
Safety shoes are recommended when handling cylinders.

Special instructions for protection and hygiene: Ensure adequate ventilation, especially in confined areas.

9.-Physical and Chemical Properties

Color and Smell:	Colorless and odorless
Physical state:	Refrigerated liquid
Odor threshold:	NA
pH:	NA
Melting point @ 1 atm (°C):	-218.79
Boiling point @ 1 atm (°C):	-182.98
Flashpoint (°C):	NA
Evaporation rate:	NA
Flammability limits (% vol./vol. in air):	NA
Flammability limits (% vol./vol. in oxygen):	NA
Vapor pressure @ 21.1 °C (kPa):	ND
Vapor density @ 21.1°C; 1 atm:	ND
Relative density of gas @ 21.1°C; 1 atm (aire = 1):	1.105
Gas density @ 21.1°C; 1 atm (kg/m^3):	1.325
Water solubility @ 0°C (vol./vol.) :	0.0491
Partition coefficient: n-octanol/agua (logKOW):	NA
Decomposition temperature (°C):	NA
Auto ignition temperature (°C):	NA
Sublimation temperature @ 1 atm (°C):	NA
Gas viscosity @ 25°C (micropoise):	201.74
Molecular weight (g/mol):	31.99
Reactivity in water:	NA
Volatility percentage:	NA

10.-Stability and Reactivity

Chemical Stability:	Stable under normal conditions.
Conditions to avoid:	None under recommended storage and handling conditions (see section 7).
Materials to avoid:	Avoid oil, grease and all other combustible materials. Flammable materials. Organic materials. Finely divided aluminium. Reducing agents. Materials such as carbon steel, low alloy carbon steel and plastic become brittle at low temperatures and are subject to failure. Use appropriate materials compatible with the cryogenic conditions present in refrigerated liquefied gas systems.
Hazardous decomposition products:	No data available.
Possibility of hazardous Reactions/Reactivity:	Violently oxidizes organic material.

11.-Toxicological Information

Information on toxicological effects

Likely routes of exposure:

Effects on Eye:	Contact with liquid may cause cold burns/frostbite.
Effects on Skin:	Contact with liquid may cause cold burns/frostbite. May cause severe frostbite.
Inhalation Effects:	Breathing 75% or more oxygen at atmospheric pressure for more than a few hours may cause nasal stuffiness, cough, sore throat, chest pain and breathing difficulty. Breathing pure oxygen under pressure may cause lung damage and also central nervous system effects.
Ingestion Effects:	Ingestion is not considered a potential route of exposure.
Symptoms:	No data available.

Acute toxicity:

Acute Oral Toxicity:	No data is available on the product itself.
Inhalation:	No data is available on the product itself.
Acute Dermal Toxicity:	No data is available on the product itself.
Skin corrosion/irritation:	No data available.
Serious eye damage/eye Irritation:	No data available.
Sensitization:	No data available.

Chronic toxicity or effects from long term exposures:

Carcinogenicity:	No data available.
Reproductive toxicity:	No data is available on the product itself.
Germ cell mutagenicity:	No data is available on the product itself.
Specific target organ systemic toxicity (single exposure):	No data available.
Specific target organ systemic toxicity (repeated exposure):	No data available.
Aspiration hazard:	No data available.

Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure

If oxygen is administered to persons with chronic obstructive pulmonary disease, raising the oxygen concentration in the blood depresses their breathing and raises their retained carbon dioxide to a dangerous level.If oxygen is administered to persons with chronic obstructive pulmonary disease, raising the oxygen concentration in the blood depresses their breathing and raises their retained carbon dioxide to a dangerous level.

12.-Ecological Information

Ecotoxicity effects

Aquatic toxicity:	No data is available on the product itself.
Toxicity to other organisms:	No data available.

Persistence and degradability

Biodegradability	No data is available on the product itself.
Mobility	No data available.
Bioaccumulation	No data is available on the product itself.

Further information
This product has no known ecotoxicological effects.

13.-Disposal considerations

Waste from residues / unused products:	Return unused product in original cylinder to supplier. Contact supplier if guidance is required.
Contaminated packaging:	Return cylinder to supplier.

14.-Transport Information

DOT/ IATA/IMDG/TDG:

UN/ID No.:	UN 1073
Proper shipping name:	Oxygen, refrigerated liquid
Class or Division:	2.2
Label(s):	2.2 (5.1)

Marine Pollutant: No.

Further Information
Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact customer service.

15.-Regulatory Information

Toxic Substance Control Act (TSCA) 12(b) Component(s): None.

Country	Regulatory	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on Inventory.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification
Acute Health Hazard.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)
This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

16.-Other information

NFPA Rating

Health:	3
Fire:	0
Instability:	0
Special:	OX

HMIS Rating

Health:	3
Flammability:	0
Physical hazard:	2

Prepared by INFRA S.A. DE C.V. Industrial Safety Management.

This Safety Data Sheet has been established in accordance with the applicable Mexican regulations (NOM-018-STPS-2015).

Details given in this document are believed to be correct at the time of going to press. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted.