MATERIAL SAFETY DATA SHEET (MSDS)
LIQUID ARGON
(Please ensure that this MSDS is received by an appropriate person)

DATE: March 2023 Version: 2
Ref. No.: MS005

1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name	LIQUID ARGON
Chemical Formula	Ar
Trade Name	Liquid Argon Cryogenic Argon
Company Identification	Les Gaz Industriels Ltd Pailles Road G.R.N.W. Republic of Mauritius Tel. No: (+230) 212-8306 Fax No: (+230) 212-0235
EMERGENCY NUMBER	(+230) 800 1133

2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	Argon
Chemical Family	Inert rare gas
CAS No.	7440-37-1
UN No.	1951
ERG No.	120
Hazchem Warning	2 C Non-flammable gas

3 HAZARDS IDENTIFICATION

Main Hazards. All portable Cryogenic Containers (PCC's) containing cryogenic liquids must be regarded as pressure vessels at all times. Excessive exposure to heat could cause the internal pressure to increase significantly with the consequent violent rupturing of the vessel. Due to its extremely low boiling point, -186°C, extreme care must be taken when handling liquid argon, otherwise frostbite can occur. Argon does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in air to below the levels necessary to support life.

Adverse health effects. Inhalation of argon in excessive concentrations can result in dizziness, nausea, vomiting, loss of consciousness and death.

Chemical Hazards At the temperature of liquid argon, ordinary carbon steels, and most alloy steels, lose their ductility, and are therefore considered to be unsafe for liquid argon service. Satisfactory materials for use with liquid argon include Type 18-8 stainless steel, and other austenitic nickel-chromium alloys, copper, Monel, brass and aluminium. Argon is extremely inert and forms no known chemical compounds.

Biological Hazards Contact between the skin and liquid argon, or uninsulated piping, or vessels containing it, can cause severe cold burn injuries.

Vapour Inhalation As gaseous argon acts as a simple asphyxiant, death may result from errors in judgement, confusion, or loss of consciousness which prevents self-rescue. At low oxygen concentrations, unconsciousness and death may occur in seconds without warning.

Eye Contact	Can cause severe cold burn injuries.
Skin Contact	Frostbite can occur from contact with liquid argon.
Ingestion	Severe cold burn injuries would occur.

Label Elements
Hazard Pictograms

Precautionary Statements
Signal word: Warning
Hazard Statements:

H281	Contains refrigerated gas: may cause cryogenic burns or injury

Precautionary Statements

P282	Wear insulating gloves/face shield/eye protection.
P336+P315	Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical examination
P403	Store in well ventilated place.

4 FIRST AID MEASURES

Prompt medical attention is mandatory in all cases of overexposure to Argon. Rescue personnel should be equipped with self-contained breathing apparatus. In case of frostbite from contact with liquid argon, place the frost-bitten part in warm water, about 40 - 42°C. If warm water is not available, or is impractical to use, wrap the affected part gently in blankets. Encourage the patient to exercise the affected part whilst it is being warmed. Do not remove clothing whilst frosted. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be removed to an uncontaminated area, and given mouth-to-mouth resuscitation and supplemental oxygen.

Eye Contact	Immediately flush with large quantities of tepid water, or with sterile saline solution. Seek medical attention.
Skin Contact	See above for handling frostbite.
Ingestion	Seek medical attention.

5 FIRE FIGHTING MEASURES

Extinguishing media As Argon is an inert gas, it does not contribute to the fire, but could help with the extinguishing by reducing the oxygen content of the air by dilution to below the level to support combustion.

Specific Hazards Argon does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in the air below the levels to support life.

Emergency Actions If possible, shut off the source of excess Argon. Evacuate area. Prevent liquid argon from entering sewers, basements and workpits. Keep the PCC, tanker or any other cryogenic vessel cool by spraying with water if exposed to a fire, or source of excessive heat. If the tanker has overturned, do not attempt to right or move it. CONTACT THE NEAREST AFROX BRANCH.

Protective Clothing Self-contained breathing apparatus. Safety gloves and shoes, or boots, should be worn when handling containers.

Environmental precautions. Argon is heavier than air and could form pockets of oxygen-deficient atmosphere in low-lying areas.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions. Do not enter any area where argon has been spilled unless tests have shown that it is safe to do so.

Environmental precautions. Argon itself does not pose a hazard to the environment. However, because of the extreme cold of the liquid, damage to the ecology can occur in the immediate environs of the spill.

Small spills Shut off the source of escaping argon. Ventilate the area.

Large spills Evacuate the area. Shut off the source of the spill if this can be done without risk. At the source dangerous cold conditions could exist. Restrict access to the area until completion of the clean-up procedure. Ventilate the area using forced-draught if necessary. Frost and vapourising liquid indicates extreme risk of cold condition.

7 HANDLING AND STORAGE

When liquid argon is held in any closed vessel or space, there must be an appropriate pressure relief device because of the very large pressure increases that can occur as the liquid argon is vapourised. Liquid argon must also be handled with all the precautions required for safety with any cryogenic fluid. Keep out of reach of children.

LES GAZ INDUSTRIELS
UNE VALEUR SÛRE
EST. 1952

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8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Hazards. As gaseous argon is a simple asphyxiant, avoid any areas where spillage has taken place. Only enter once testing has proved the atmosphere to be safe.

Engineering control measures. Engineering control measures are preferred to reduce exposure to Oxygen-depleted atmospheres. General methods include forced-draught ventilation, separate from other exhaust ventilation systems. Ensure that sufficient fresh air enters at, or near, floor level.

Personal protection Self-contained breathing apparatus should always be worn when entering area where oxygen depletion may have occurred. Safety goggles, gloves and shoes or boots should be worn when handling containers.

Skin Wear loose-fitting overalls, preferably without pockets.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Chemical Symbol	Ar
Molecular Weight	39,948
Boiling point @ 101,325 kPa	-185,9°C
Relative Density of vapourised liquid (Air=1)	1,380
Critical temperature	-122,29°C
Latent heat of vapourisation @ boiling point	160,7 kJ/kg
Colour	Pale blue
Odour	None

10 STABILITY AND REACTIVITY

Conditions to avoid The dilution of the oxygen concentration in the atmosphere to levels which cannot support life.

Incompatible Materials. Due to the extremely low boiling point, -186°C, extreme care must be taken when handling liquid argon, otherwise frostbite can occur, as well as embrittlement of many materials such as plastic and steel.

Hazardous Decomposition Products -None

11 TOXICOLOGICAL INFORMATION

Acute Toxicity No known effect

(For further information see Section 3. Adverse Health Effects).

12 ECOLOGICAL INFORMATION

Argon is heavier than air and can cause pockets of oxygen depleted atmosphere in low-lying areas. It does not pose a hazard to the ecology. Liquid contact with living creatures and plant life could cause severe damage.

13 DISPOSAL CONSIDERATIONS

Disposal Methods Small amounts may be blown to the atmosphere under controlled conditions. Large amounts should only be handled by the gas supplier.

Disposal of packaging The disposal of containers must only be handled by the gas supplier.

14 TRANSPORT INFORMATION

ROAD TRANSPORTATION

UN No.	1951
ERG No.	120
Hazchem warning	2C Non-flammable gas

SEA TRANSPORTATION

IMDG	1951
Class	
Packaging group	
Label	Non-flammable gas

AIR TRANSPORTATION

ICAO/IATA Code	1951
Class	2.2
Packaging group	
Packaging instructions	
- Cargo	202
- Passenger	202
Maximum quantity allowed	
- Cargo	500 kg
- Passenger	50 kg

15 REGULATORY INFORMATION

EEC Hazard class Non-flammable
National legislation: OHSact & Regulations (85 of 1993)
SANS 10234 and its supplement

16 OTHER INFORMATION

Bibliography
Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases - 3rd Edition
Matheson. Matheson Gas Data Book - 6th Edition
SABS 0265 - Labelling of Dangerous Substances

17 EXCLUSION OF LIABILITY