



# ARGON

## CHEMICAL PRODUCT

**PRODUCT NAME:** Argon, compressed

**CHEMICAL NAME:** Argon

**CHEMICAL FAMILY:** Inert Gas

**SYMBOL:** Ar

**SYNONYMS:** Argon

**[USES]:** Various, inerting, medical, instrumentation

## INGREDIENT COMPOSITION INFORMATION

| INGREDIENTS NAME | PERCENTAGE | OHSA<br>PEL-TWA | ACGIH<br>TLV-TWA     |
|------------------|------------|-----------------|----------------------|
| Argon            | >99%       | None            | Simple<br>Asphyxiant |

## HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

**CAUTION!**

- High pressure gas.
- Can cause rapid suffocation.
- Do not breathe gas.
- Self-contained breathing apparatus may be required by rescue workers.

**POTENTIAL HEALTH EFFECTS:**

**ROUTES OF EXPOSURE:**

**INHALATION:** Simple asphyxiant. Argon is non-toxic, but may cause suffocation by displacing the oxygen in air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmosphere containing 8% to 10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

**EYE CONTACT:** Not applicable.

**SKIN CONTACT:** Not applicable.

**[SKIN ABSORPTION]:** Not applicable.

[INGESTION]: Not applicable  
CHRONIC EFFECTS: Not established  
MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE: None  
OTHER EFFECTS OF OVEREXPOSURE: None  
CARCINOGENICITY: Argon is not listed.

## FIRST AID MEASURES

INHALATION: Persons suffering from lack of oxygen should be removed to fresh air. If victim is not breathing, administer artificial respiration. If breathing, administer oxygen. Obtain prompt medical attention.  
EYE CONTACT: Not applicable  
SKIN CONTACT: Not applicable  
INGESTION: Not applicable  
NOTES TO PHYSICIAN: None

## FIRE FIGHTING MEASURES

FLASH POINT: Not applicable  
FLAMMABLE LIMITS IN AIR BY VOLUME:  
LOWER: Not applicable UPPER: Not applicable  
EXTINGUISHING MEDIA: Argon is nonflammable and does not support combustion. Use extinguishing media appropriate for surrounding fire.  
SPECIAL FIRE FIGHTING INSTRUCTIONS: Argon is a simple asphyxiant. If possible, remove argon cylinders from fire area or cool with water. self-contained breathing apparatus may be required for rescue workers.  
UNUSUAL FIRE AND EXPLOSION HAZARDS: Upon exposure to intense heat or flame, cylinder may vent rapidly and/or rupture violently. Most cylinders are designed to vent contents when exposed to elevated temperatures. Pressure in a container can build up due to heat and it may rupture if pressure relief device should fail to function.  
HAZARDOUS COMBUSTION PRODUCTS: None known  
[SENSITIVITY TO STATIC DISCHARGE]: None  
[SENSITIVITY TO MECHANICAL IMPACT]: None

## ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:** Evacuate all personnel from the affected area. Shut off source of argon, if possible without risk. Ventilate area or remove cylinders to an outdoor location. If leaking from cylinder or its valve, contact your supplier.

## HANDLING AND STORAGE

PRECAUTIONS TO BE TAKEN IN STORAGE: Store and use with adequate ventilation. 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. Do not allow storage area temperature to exceed 125°F (52°C). 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.  
PRECAUTIONS TO BE TAKEN IN HANDLING: Use a suitable hand truck for cylinder movement. Never attempt to lift a cylinder by its valve protection cap. If user experiences any difficulty operating 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. For additional precautions in using argon, see other Information.

## EXPOSURE CONTROLS/PERSONAL PROTECTION

### ENGINEERING CONTROLS:

VENTILATION: Natural or mechanical to prevent oxygen-deficient atmospheres under 19.5% oxygen.

### RESPIRATORY PROTECTION (SPECIFY TYPE):

General Use: None required

Emergency Use: Self-contained breathing apparatus (SCBA or positive pressure airline with mask are to be used in oxygen-deficient atmosphere. Air purifying respirators will not provide protection).

PROTECTIVE GLOVES : Work gloves are recommended when handling cylinders.

EYE PROTECTION : Safety glasses are recommended when handling cylinders.

OTHER PROTECTIVE EQUIPMENT : Safety shoes are recommended when handling cylinders.

## PHYSICAL AND CHEMICAL PROPERTIES

**MOLECULAR WEIGHT:** 28.0134

**BOILING POINT** @101.325 kpa @ 185.9°C

**RELATIVE DENSITY, GAS** @ 101.325 kpa @ 0°C Air = 1 = 1.380

**TRIPLE POINT TEMPERATURE** = -308.9°F

**VAPOR PRESSURE (AT 20 °C):** Not applicable

**EVAPORATION RATE (Butyl Acetate =1):** Gas, not applicable

**SOLUBILITY IN WATER:** @ 101.325 kpa (per partial pressure 20°C = 0.0337 cm<sup>3</sup>/1 cm<sup>3</sup> water

**EXPANSION RATIO:** Not applicable [pH]: Not applicable

**APPEARANCE, ODOR AND STATE:** Colorless, odorless and tasteless gas at normal temperature and pressure.

**[COEFFICIENT OF WATER/OIL DISTRIBUTION]:** Not available

**[ODOR THRESHOLD]:** Not applicable

## STABILITY AND REACTIVITY

**STABILITY:** Stable

**CONDITIONS TO AVOID:** None

**INCOMPATIBILITY (Materials to Avoid) :** None

**REACTIVITY:**

**A) HAZARDOUS DECOMPOSITION PRODUCTS:** None      **B) HAZARDOUS POLYMERIZATION:** Will not occur

## TOXICOLOGICAL INFORMATION

Argon is a simple asphyxiant

**(IRRITANCY OF MATERIAL):** None

**(SENSITIZATION TO MATERIAL):** None

**(REPRODUCTIVE EFFECTS):** None

**(TERATOGENICITY):** None

**(MUTAGENICITY):** None

**(SYNERGISTIC MATERIALS):** None

## ECOLOGICAL INFORMATION

No adverse ecological effects are expected. Argon does not contain any Class I or Class II ozone depleting chemicals. Argon is not listed as a marine pollutant.

## DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:** Do not attempt to dispose of residual or unused quantities. Return cylinder to supplier. For emergency disposal, secure the cylinder and slowly discharge gas to the atmosphere in a well ventilated area or outdoors.

## TRANSPORT INFORMATION

**DOT/IMO SHIPPING NAME:** Argon, compressed

**HAZARD CLASS:** 2.2 (Nonflammable Gas)

**IDENTIFICATION NUMBER:** UN 1006

**PRODUCT RQ:** Not applicable

**SHIPPING LABEL(s) :** Nonflammable gas

**PLACARD (When required):** Nonflammable 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.

## 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.

**MIXTURES:** When two or more gases or liquified 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. Consult an Industrial Hygienist, or other trained person when you make your safety evaluation of the end product. Remember, gases and liquids have their properties that can cause serious injury or death.

**OTHER INFORMATION:****NFPA RATINGS:**

HEALTH: =0

FLAMMABILITY: =0

INSTABILITY: =0

SPECIAL: =SA (CGA Rrecommends this to designate simple asphyxiant.)

**HMIS RATINGS:**

HEALTH: =0

FLAMMABILITY: =0

REACTIVITY: =0

# MATERIAL SAFETY DATA SHEET

## LIQUID ARGON

### CHEMICAL PRODUCT

**PRODUCT NAME:** Argon, refrigerated liquid**CHEMICAL NAME:** Argon**CHEMICAL FAMILY:** Inert Gas**FORMULA:** Ar**SYNONYMS:** Argon**[USES]:** Various, inerting

### INGREDIENT COMPOSITION INFORMATION

| INGREDIENTS NAME | PERCENTAGE | OHSA PEL-TWA | ACGIH TLV-TWA     |
|------------------|------------|--------------|-------------------|
| ARGON            | 99.98      | None         | Simple Asphyxiant |

### HAZARDS IDENTIFICATION

**EMERGENCY OVERVIEW****WARNING!** Extremely cold liquid and gas under pressure.

Can cause rapid suffocation.

Can cause severe frostbite.

**POTENTIAL HEALTH EFFECTS:****ROUTES OF EXPOSURE:****INHALATION:** Simple asphyxiant. Argon is non-toxic, but may cause suffocation by displacing the oxygen in air. Exposure to oxygen-deficient atmosphere (<19.5%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8%

to 10% or less oxygen will bring about unconsciousness without warning and so quickly that the individuals cannot help or protect themselves. Lack of sufficient oxygen may cause serious injury or death.

**EYE CONTACT.** Tissue freezing and severe cryogenic burns of eyes**SKIN CONTACT.** Tissue freezing and severe cryogenic burns of skin.**[SKIN ABSORPTION]:** Not applicable**[INGESTION]:** Not applicable**CHRONIC EFFECTS:** Not established**MEDICAL CONDITIONS AGGRAVATED BY OVEREXPOSURE:** None**OTHER EFFECTS OF OVEREXPOSURE:** None**CARCINOGENICITY:** Argon is not listed.

### HANDLING AND STORAGE

**PRECAUTIONS TO BE TAKEN IN STORAGE:** Store and use with adequate ventilation. Do not store in a confined space. Cryogenic containers are equipped with pressure relief devices to control internal pressure. Under normal conditions these containers will periodically vent product. Some metals such as carbon steel may become brittle at low temperatures and will easily fracture. Prevent entrapment of liquid in closed systems or piping without pressure relief.**PRECAUTIONS TO BE TAKEN IN HANDLING:** Never allow any unprotected part of the body to touch uninsulated pipes or vessels that contain cryogenic fluids. The extremely cold metal will cause the flesh to stick fast and tear when one attempts to withdraw from it. Use a suitable four-wheel hand truck for container movement. Cryogenic containers shall be handled and stored in an upright position. Do not drop or roll containers on their sides. If user experiences any difficulty operating container valve discontinue use and contact supplier. For additional precautions in using liquid argon see other Information.

## EXPOSURE CONTROLS/PERSONAL PROTECTION

### ENGINEERING CONTROLS:

**VENTILATION:** Natural or mechanical to prevent oxygen-deficient atmospheres under 19.5% oxygen.

### RESPIRATORY PROTECTION (SPECIFY TYPE):

**General Use:** None required

**Emergency Use:** Self-contained breathing apparatus (SCBA or positive pressure airline with mask) are to be used in oxygen-deficient atmosphere. Air purifying respirators will not function.

**PROTECTIVE GLOVES :** Loose fitting thermal insulated or leather gloves.

**EYE PROTECTION :** Full face shield and safety glasses are recommended.

**OTHER PROTECTIVE EQUIPMENT :** Safety shoes are recommended when handling liquid containers. Long sleeve shirts and trousers without cuffs.

## PHYSICAL AND CHEMICAL PROPERTIES

**ATOMIC WEIGHT.** 99.948

**BOILING POINT (1 ATM):** @ 101.325 kpa = 185.9°C

**DENSITY LIQUID @ 101.325 kpa @ 87.29°K = 1.3919 kg/cm<sup>3</sup>**

**TRIPLE POINT TEMPERATURE - 308.9°F**

**VAPOR PRESSURE (AT 20 °C):** Not applicable

**EVAPORATION RATE (Butyl Acetate =1):** Gas, not applicable

**SOLUBILITY IN WATER:** @ 101.325 Kpa partial pressure @ 20°C = 0.0337 cm<sup>3</sup>/1 cm<sup>3</sup> water

[pH]: Not applicable

**APPEARANCE, ODOR AND STATE:** Colorless, odorless cryogenic liquid

**[COEFFICIENT OF WATER/OIL DISTRIBUTION]:** Not available

**[ODOR THRESHOLD]:** Not applicable

## STABILITY AND REACTIVITY

**STABILITY:** Stable

**CONDITIONS TO AVOID:** None

**INCOMPATIBILITY (Materials to Avoid) :** None

**REACTIVITY:**

**A) HAZARDOUS DECOMPOSITION PRODUCTS:** None

**B) HAZARDOUS POLYMERIZATION:** Will not occur

## TOXICOLOGICAL INFORMATION

Argon is a simple asphyxiant

**(IRRITANCY OF MATERIAL):** None

**(SENSITIZATION TO MATERIAL):** None

**(REPRODUCTIVE EFFECTS):** None

**(TERATOGENICITY):** None

**(MUTAGENICITY):** None

**(SYNERGISTIC MATERIALS):** None

## ECOLOGICAL INFORMATION

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**OTHER INFORMATION:**

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FLAMMABILITY: =0

INSTABILITY: =0

SPECIAL: =SA (CGA Recommends this to designate simple asphyxiant.)

**HMIS RATINGS:**

HEALTH: =

FLAMMABILITY: =0

REACTIVITY: =0