Argon/Helium/CO2 Mixture

Safety Data Sheet E-4713

according to the Hazardous Products Regulation (February 11, 2015)

Issue date: 10-15-1979 Revision date: 09-25-2023 Supersedes: 09-07-2023 SDS CA Version: 1.2

SECTION 1: Identification

1.1. Product identifier

Product form : Mixture

Product name : Argon/Helium/CO2 Mixture

Other means of identification : Helistar A-1025, A415, CS, GV, HiDep, SS, Robostarr SS

Product group : Core Products

1.2. Recommended use and restrictions on use

Recommended uses and restrictions : Welding,Use as directed.

1.3. Supplier

Linde Canada inc.
500 — 5015 Spectrum Way
Mississauga - Canada L4W 0E4
T 1-905-803-1600 - F 1-905-803-1682
www.lindecanada.ca

1.4. Emergency telephone number

Emergency number : 1-800-363-0042
Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product.
For routine information, contact your supplier or Linde sales representative.

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS-CA classification

Gases under pressure : Compressed gas H280
Simple Asphyxiant

2.2. GHS Label elements, including precautionary statements

GHS CA labelling

Hazard pictograms :

GHS04

Signal word : Warning

Hazard statements : CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
MAY DISPLACE OXYGEN AND CAUSE RAPID SUFFOCATION

Precautionary statements : Do not handle until all safety precautions have been read and understood.
Use and store only outdoors or in a well-ventilated place.
Use a back flow preventive device in the piping.
Use only with equipment rated for cylinder pressure.
Close valve after each use and when empty.
Protect from sunlight when ambient temperature exceeds 52°C (125°F).

2.3. Other hazards

Other hazards which do not result in classification : **Welding-specific:** For unique hazards specific to welding, see Sections 8.2 and 16.
Asphyxiant in high concentrations.

2.4. Unknown acute toxicity (GHS CA)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	CAS No.	% (Vol)	Common Name (synonyms)
Argon	(CAS-No.) 7440-37-1	0.0001 – 99.9998	Argon, compressed
Helium	(CAS-No.) 7440-59-7	0.0001 – 99.9998	Helium, compressed / Helium, liquid, non-pressurized / Helium, refrigerated liquid / Helium 3 / Helium gas
Carbon dioxide	(CAS-No.) 124-38-9	0.0001 – 1.9999	CARBON DIOXIDE

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : Adverse effects not expected from this product.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects : No additional information available

4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : None.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

Suitable extinguishing media : Use extinguishing media appropriate for surrounding fire.

5.2. Unsuitable extinguishing media

No additional information available

5.3. Specific hazards arising from the hazardous product

Reactivity : None.

Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

5.4. Special protective equipment and precautions for fire-fighters

Firefighting instructions : **WARNING: High pressure gas**

Compressed gas: asphyxiant

Suffocation hazard by lack of oxygen

Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations.

Protection during firefighting : Compressed gas: asphyxiant. Suffocation hazard by lack of oxygen.

Special protective equipment for fire fighters : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters.

Other information : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by TC.).

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures : **Warning: High-pressure gas.** Evacuate personnel to a safe area. Appropriate self-contained breathing apparatus may be required. Approach suspected leak area with caution. Remove all sources of ignition. if safe to do so. Reduce gas with fog or fine water spray. Stop flow of product if safe to do so. Ventilate area or move container to a well-ventilated area. Before entering the area, especially a confined area, test for sufficient oxygen.

Personal Precautions, Protective Equipment and Emergency Procedures : General measures : Ensure adequate ventilation. Personal Precautions, Protective Equipment and Emergency Procedures : EVACUATE ALL PERSONNEL FROM AFFECTED AREA. Use appropriate protective equipment. If leak is on user's equipment, be certain to purge piping before attempting repairs. If leak is on a container or container valve contact the closest Linde Canada location.

6.2. Methods and materials for containment and cleaning up

For containment : Try to stop release if safe to do so.

Methods for cleaning up : Dispose of contents/container in accordance with container supplier/owner instructions.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Wear leather safety gloves and safety shoes when handling cylinders. Protect containers from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g, wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store in a cool, well-ventilated place. Store and use with adequate ventilation. Store only where temperature will not exceed 125°F (52°C). Firmly secure containers upright to keep them from falling or being knocked over. Install valve protection cap firmly in place by hand. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods.

OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE: When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Carbon dioxide (124-38-9)		
USA - ACGIH	ACGIH OEL TWA [ppm]	5000 ppm
USA - ACGIH	ACGIH OEL STEL [ppm]	30000 ppm
USA - OSHA	OSHA PEL TWA [1]	9000 mg/m³
USA - OSHA	OSHA PEL TWA [2]	5000 ppm
Canada (Quebec)	VECD (OEL STEL)	54000 mg/m³
Canada (Quebec)	VECD (OEL STEL) [ppm]	30000 ppm
Canada (Quebec)	VEMP (OEL TWA)	9000 mg/m³
Canada (Quebec)	VEMP (OEL TWA) [ppm]	5000 ppm

Carbon dioxide (124-38-9)		
Alberta	OEL STEL	54000 mg/m³
Alberta	OEL STEL [ppm]	30000 ppm
Alberta	OEL TWA	9000 mg/m³
Alberta	OEL TWA [ppm]	5000 ppm
British Columbia	OEL STEL [ppm]	15000 ppm
British Columbia	OEL TWA [ppm]	5000 ppm
Manitoba	OEL STEL [ppm]	30000 ppm
Manitoba	OEL TWA [ppm]	5000 ppm
New Brunswick	OEL STEL	54000 mg/m³
New Brunswick	OEL STEL [ppm]	30000 ppm
New Brunswick	OEL TWA	9000 mg/m³
New Brunswick	OEL TWA [ppm]	5000 ppm
Newfoundland & Labrador	OEL STEL [ppm]	30000 ppm
Newfoundland & Labrador	OEL TWA [ppm]	5000 ppm
Nova Scotia	OEL STEL [ppm]	30000 ppm
Nova Scotia	OEL TWA [ppm]	5000 ppm
Nunavut	OEL STEL	27000 mg/m³
Nunavut	OEL STEL [ppm]	15000 ppm
Nunavut	OEL TWA	9000 mg/m³
Nunavut	OEL TWA [ppm]	5000 ppm
Northwest Territories	OEL STEL [ppm]	30000 ppm
Northwest Territories	OEL TWA [ppm]	5000 ppm
Ontario	OEL STEL [ppm]	30000 ppm
Ontario	OEL TWA [ppm]	5000 ppm
Prince Edward Island	OEL STEL [ppm]	30000 ppm
Prince Edward Island	OEL TWA [ppm]	5000 ppm
Québec	VECD (OEL STEL)	54000 mg/m³
Québec	VECD (OEL STEL) [ppm]	30000 ppm
Québec	VEMP (OEL TWA)	9000 mg/m³
Québec	VEMP (OEL TWA) [ppm]	5000 ppm
Saskatchewan	OEL STEL [ppm]	30000 ppm
Saskatchewan	OEL TWA [ppm]	5000 ppm
Yukon	OEL STEL	27000 mg/m³
Yukon	OEL STEL [ppm]	15000 ppm
Yukon	OEL TWA	9000 mg/m³
Yukon	OEL TWA [ppm]	5000 ppm

8.2. Appropriate engineering controls

Appropriate engineering controls : Use a local exhaust system with sufficient flow velocity to maintain an adequate supply of air in the worker's breathing zone. Mechanical (general): General exhaust ventilation may be acceptable if it can maintain an adequate supply of air. Provide adequate general and local exhaust ventilation. Ensure exposure is below occupational exposure limits (where available).

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Gloves. Face shield. Safety glasses.

Hand protection	:	Wear work gloves when handling containers; welding gloves for welding. Gloves must be free of oil and grease. Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.
Eye protection	:	Wear safety glasses with side shields. Safety eye wear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, or dusts. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection" and any provincial regulations, local bylaws, or guidelines.
Skin and body protection	:	Wear work gloves and metatarsal shoes for cylinder handling. Protective equipment where needed. Select in accordance with OSHA 29 CFR 1910.132, 1910.136, and 1910.138. As needed for welding, wear hand, head, and body protection to help prevent injury from radiation and sparks. (See ANSI Z49.1.) At a minimum, this includes welder's gloves and protective goggles, and may include arm protectors, aprons, hats, and shoulder protection as well as substantial clothing. Wear metatarsal shoes and work gloves for cylinder handling, and protective clothing where needed. Wear appropriate chemical gloves during cylinder changeout or wherever contact with product is possible.
Respiratory protection	:	Choose in accordance with provincial directives and regulations. Selection should also be based on the current CSA standards Z94.4, "Selection, care and use of respirators." Respirators should be approved by NIOSH and MSHA. **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).
Thermal hazard protection	:	Wear cold insulating gloves when transfilling or breaking transfer connections.
Other information	:	**Other protection :** Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

(a) Physical state	:	Gas
(b) Colour	:	Colourless.
(c) Odour	:	Odourless.
Odour threshold	:	No data available
(d) Melting point	:	No data available
Freezing point	:	No data available
(e) Boiling point	:	No data available
(f) Flammability	:	Non flammable.
(g) Flammability (solid, gas)	:	
(h) Flash point	:	No data available
(i) Auto-ignition temperature	:	No data available
(j) Decomposition temperature	:	No data available
(k) pH	:	Not applicable.
(l) Viscosity, kinematic	:	Not applicable.
(m) Solubility	:	Water: No data available
(n) Partition coefficient – n-octanol/water [log Pow]	:	Not applicable.
(o) Vapour pressure	:	Not applicable.
(p) Density	:	1.166 – 1.275 kg/m³ HeliStar SS: 1.166 kg/m3 (0.0728 lb/ft3) , HeliStarCS: 1.275 kg/m3 (0.0796 lb/ft3)
Relative gas density	:	0.962 – 1.062 HeliStar SS: 0.972, HeliStar CS: 1.062
(r) Particle characteristics	:	No data available
(v) Oxidizing properties	:	None.
(w) Relative evaporation rate (butylacetate=1)	:	No data available
Relative evaporation rate (ether=1)	:	Not applicable.

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

Reactivity : None.

Chemical stability : Stable under normal conditions.

Incompatible materials : Alkali metals, Alkaline earth metals, Acetylide forming metals, Chromium, Titanium > 1022°F (550°C), Uranium (U) > 1382°F (750°C), Magnesium > 1427°F (775°C).

Hazardous decomposition products : Using this product in welding and cutting may create additional hazards. The arc from electric arc welding may form gaseous reaction products such as carbon monoxide and carbon dioxide. Ozone and nitrogen oxides may be formed by the radiation from the arc. Other decomposition products of arc welding and cutting originate from the volatilization, reaction, and oxidization of the material being worked.

SECTION 11: Toxicological information

11.1 Likely routes of exposure : Inhalation

11.2 Symptoms related to the physical, chemical, and toxicological characteristics : No additional information available

11.3 Delayed and immediate effects and chronic effects

Acute toxicity (oral) : Not classified

Acute toxicity (dermal) : Not classified

Acute toxicity (inhalation) : Not classified

Skin corrosion/irritation : Not classified
pH: Not applicable.

Serious eye damage/irritation : Not classified
pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

STOT-single exposure : Not classified

STOT-repeated exposure : Not classified

Aspiration hazard : Not classified

11.4 Toxicity

Argon/Helium/CO2 Mixture	
LC50 Inhalation - Rat [ppm]	No data available

SECTION 12: Ecological information

12.1. Toxicity

Ecology - general : No ecological damage caused by this product.

12.2. Persistence and degradability

Argon/Helium/CO2 Mixture	
Persistence and degradability	No ecological damage caused by this product.

Argon (7440-37-1)	
Persistence and degradability	No ecological damage caused by this product.

Helium (7440-59-7)	
Persistence and degradability	No ecological damage caused by this product.

Carbon dioxide (124-38-9)	
Persistence and degradability	No ecological damage caused by this product.

12.3. Bioaccumulative potential

Argon/Helium/CO2 Mixture	
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Argon (7440-37-1)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Helium (7440-59-7)	
Partition coefficient n-octanol/water (Log Pow)	Not applicable for inorganic products.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

Carbon dioxide (124-38-9)	
BCF - Fish [1]	(no bioaccumulation)
Partition coefficient n-octanol/water (Log Pow)	0.83
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Bioaccumulative potential	No ecological damage caused by this product.

12.4. Mobility in soil

Argon/Helium/CO2 Mixture	
Mobility in soil	No data available.
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.

Argon (7440-37-1)	
Mobility in soil	No data available.
Partition coefficient n-octanol/water (Log Pow)	Not applicable.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Ecology - soil	No ecological damage caused by this product.

Helium (7440-59-7)	
Mobility in soil	No data available.
Partition coefficient n-octanol/water (Log Pow)	Not applicable for inorganic products.
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Ecology - soil	No ecological damage caused by this product.

Carbon dioxide (124-38-9)	
Mobility in soil	No data available.
Partition coefficient n-octanol/water (Log Pow)	0.83
Partition coefficient n-octanol/water (Log Kow)	Not applicable.
Ecology - soil	No ecological damage caused by this product.

12.5. Other adverse effects

Effect on the ozone layer : None.

SECTION 13: Disposal considerations

Product/Packaging disposal recommendations : Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements. Dispose of contents/container in accordance with container supplier/owner instructions.

SECTION 14: Transport information

14.1. Basic shipping description

In accordance with TDG

Transportation of Dangerous Goods

UN-No. (TDG) : UN1956
TDG Primary Hazard Classes : 2.2 - Class 2.2 - Non-Flammable, Non-Toxic Gases
Proper shipping name : COMPRESSED GAS, N.O.S.

Explosive Limit and Limited Quantity Index : 0.125 L
Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index : 75 L

14.2. Air and sea transport

IMDG

UN-No. (IMDG) : 1956
Proper Shipping Name (IMDG) : COMPRESSED GAS, N.O.S.
Class (IMDG) : 2.2 - Non-flammable, non-toxic gases

IATA

UN-No. (IATA) : 1956
Proper Shipping Name (IATA) : COMPRESSED GAS, N.O.S.
Class (IATA) : 2 - Gases

SECTION 15: Regulatory information

15.1. National regulations

Argon (7440-37-1)
Listed on the Canadian DSL (Domestic Substances List)

Helium (7440-59-7)
Listed on the Canadian DSL (Domestic Substances List)

Carbon dioxide (124-38-9)
Listed on the Canadian DSL (Domestic Substances List)

15.2. International regulations

Argon (7440-37-1)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on INSQ (Mexican National Inventory of Chemical Substances)

Helium (7440-59-7)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) Listed on KECL/KECI (Korean Existing Chemicals Inventory) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on INSQ (Mexican National Inventory of Chemical Substances)

Carbon dioxide (124-38-9)
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SECTION 16: Other information

Issue date : 15/10/1979

Revision date : 25/09/2023

Supersedes : 07/09/2023

Indication of changes:

Other information : When you mix two or more chemicals, you can 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 evaluate the end product. Before using any plastics, confirm their compatibility with this product.

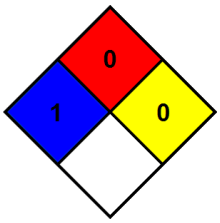
Linde asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information.

The opinions expressed herein are those of qualified experts within Linde Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Linde Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Linde Canada Inc, SDSs are furnished on sale or delivery by Linde Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Linde sales representative, local distributor, or supplier, or download from www.lindecanada.ca.

NFPA health hazard : 1 - Materials that, under emergency conditions, can cause significant irritation.

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA instability : 0 - Material that in themselves are normally stable, even under fire conditions.



Hazard Rating	
Health	: 1 Slight Hazard - Irritation or minor reversible injury possible
Flammability	: 0 Minimal Hazard - Materials that will not burn
Physical	: 3 Serious Hazard - Materials that may form explosive mixtures with water and are capable of detonation or explosive reaction in the presence of a strong initiating source. Materials may polymerize, decompose, self-react, or undergo other chemical change at normal temperature and pressure with moderate risk of explosion

SDS Canada (GHS) - Linde NEW

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.