



# CARBON DIOXIDE (4-15% ), OXYGEN (2-4% ) in ARGON

## Safety Data Sheet

### 1. IDENTIFICATION

#### Product identifier

Product Name CARBON DIOXIDE (4-15% ), OXYGEN (2-4% ) in ARGON

#### Other means of identification

Safety data sheet number LIND-M0034  
 UN/ID no. UN1956  
 Trade name CORGON 7.5O2,CORGON 12O2, ARGOSHIELD UNIVERSAL, ARGOSHIELD LIGHT

#### Recommended use of the chemical and restrictions on use

Recommended Use Industrial and professional use.  
 Uses advised against Consumer use

#### Details of the supplier of the safety data sheet

Linde Gas North America LLC - Linde Merchant Production Inc. - Linde LLC  
 575 Mountain Ave.  
 Murray Hill, NJ 07974  
 Phone: 908-464-8100  
[www.lindeus.com](http://www.lindeus.com)

Linde Gas Puerto Rico, Inc.  
 Road 869, Km 1.8  
 Barrio Palmas, Catano, PR 00962  
 Phone: 787-641-7445  
[www.pr.lindegas.com](http://www.pr.lindegas.com)

Linde Canada Limited  
 5860 Chedworth Way  
 Mississauga, Ontario L5R 0A2  
 Phone: 905-501-1700  
[www.lindecana.com](http://www.lindecana.com)

\* May include subsidiaries or affiliate companies/divisions.

For additional product information contact your local customer service.

#### Emergency telephone number

Company Phone Number 800-232-4726 (Linde National Operations Center, US)  
 905-501-0802 (Canada)  
 CHEMTREC: 1-800-424-9300 (North America) +1-703-527-3887 (International)

## 2. HAZARDS IDENTIFICATION

### Classification

#### OSHA Regulatory Status

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Gases under pressure	Compressed gas
Simple asphyxiants	Yes

### Label elements



Signal word

Warning

#### Hazard Statements

Contains gas under pressure; may explode if heated  
May displace oxygen and cause rapid suffocation

May increase respiration and heart rate

#### Precautionary Statements - Prevention

Do not handle until all safety precautions have been read and understood  
Avoid breathing gas  
Use and store only outdoors or in a well ventilated place  
Use a backflow preventive device in piping  
Use only with equipment rated for cylinder pressure  
Close valve after each use and when empty

#### Precautionary Statements - Response

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical attention/advice.

#### Precautionary Statements - Storage

Protect from sunlight when ambient temperature exceeds 52°C/125°F

#### Hazards not otherwise classified (HNOC)

Not applicable

## 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Volume %	Chemical Formula
Argon	7440-37-1	80-95	Ar
Carbon dioxide	124-38-9	4-15	CO <sub>2</sub>

Oxygen	7782-44-7	1 - 5	O <sub>2</sub>
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Composition covers range of mixtures that fall within the same hazard classifications.

#### 4. FIRST AID MEASURES

Description of first aid measures

General advice	Show this safety data sheet to the doctor in attendance.
Inhalation	Remove to fresh air and keep comfortable for breathing. If breathing is difficult, give oxygen. If breathing has stopped, give artificial respiration. Get medical attention immediately.
Skin contact	None under normal use. Get medical attention if symptoms occur.
Eye contact	None under normal use. Get medical attention if symptoms occur.
Ingestion	Not an expected route of exposure.
Self-protection of the first aider	RESCUE PERSONNEL SHOULD BE EQUIPPED WITH SELF-CONTAINED BREATHING APPARATUS.

Most important symptoms and effects, both acute and delayed

Symptoms	Simple asphyxiant. May cause suffocation by displacing the oxygen in the 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 8-10% 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. Depending on concentration and duration of exposure to carbon dioxide may cause increased respirations, headache, mild narcotic effects, increased blood pressure and pulse, and asphyxiation. Symptoms of overexposure become more apparent when atmospheric oxygen is decreased to 15-17%.
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Indication of any immediate medical attention and special treatment needed

Note to physicians	Treat symptomatically.
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#### 5. FIRE-FIGHTING MEASURES

Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific extinguishing methods

Continue to cool fire exposed cylinders until flames are extinguished. Damaged cylinders should be handled only by specialists.

Specific hazards arising from the chemical

Non-flammable gas. Cylinders may rupture under extreme heat.

Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

#### 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions	Evacuate personnel to safe areas. Ensure adequate ventilation, especially in confined areas.
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Monitor oxygen level. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.

Environmental precautions

Environmental precautions Prevent spreading of vapors through sewers, ventilation systems and confined areas.

Methods and material for containment and cleaning up

Methods for containment Stop the flow of gas or remove cylinder to outdoor location if this can be done without risk. If leak is in container or container valve, contact the appropriate emergency telephone number in Section 1 or call your closest Linde location.

Methods for cleaning up Return cylinder to Linde or an authorized distributor.

**7. HANDLING AND STORAGE**

Precautions for safe handling

Advice on safe handling

Protect cylinders from physical damage: do not drag, roll, slide or drop. Never attempt to lift a cylinder by its valve protection cap. When moving cylinders, even for short distance, use a cart designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar, etc.) into valve cap openings. Doing so may damage valve, causing leak to occur. Use an adjustable strap wrench to remove over-tight or rusted caps. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. Use only with adequate ventilation. Use only with equipment rated for cylinder pressure. Use a backflow preventive device in piping. Close valve after each use and when empty. Ensure the complete gas system has been checked for leaks before use.

Never put cylinders into trunks of cars or unventilated areas of passenger vehicles. Never attempt to refill a compressed gas cylinder without the owner's written consent. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit.

Only experienced and properly instructed persons should handle gases under pressure. Always store and handle compressed gas cylinders in accordance with Compressed Gas Association, pamphlet CGA-P1, Safe Handling of Compressed Gases in Containers.

For additional recommendations consult Compressed Gas Association's (CGA) Safety Bulletin SB-2, Oxygen-Deficient Atmospheres.

Conditions for safe storage, including any incompatibilities

Storage Conditions Store in cool, dry, well-ventilated area of non-combustible construction away from heavily trafficked areas and emergency exits. Cylinders should be stored upright with valve protection cap in place and firmly secured to prevent falling. Keep at temperatures below 52°C / 125°F. Full and empty cylinders should be segregated. Use a "first in-first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Stored containers should be periodically checked for general condition and leakage.

Incompatible materials Carbon dioxide is incompatible with: Certain reactive metals, hydrides, moist cesium monoxide, or lithium acetylene carbide diammino may ignite. Passing carbon dioxide over a mixture of sodium peroxide and aluminum or magnesium may explode.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

Control parameters

**Exposure Guidelines**

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Carbon dioxide 124-38-9	STEL = 30000 ppm TWA: 5000 ppm	TWA: 5000 ppm TWA: 9000 mg/m <sup>3</sup> (vacated) TWA: 10000 ppm (vacated) TWA: 18000 mg/m <sup>3</sup> (vacated) STEL: 30000 ppm (vacated) STEL: 54000 mg/m <sup>3</sup>	IDLH: 40000 ppm TWA: 5000 ppm TWA: 9000 mg/m <sup>3</sup> STEL: 30000 ppm STEL: 54000 mg/m <sup>3</sup>

*ACGIH TLV: American Conference of Governmental Industrial Hygienists - Threshold Limit Value. OSHA PEL: Occupational Safety and Health Administration - Permissible Exposure Limits. NIOSH IDLH: Immediately Dangerous to Life or Health*

**Other Information** Vacated limits revoked by the Court of Appeals decision in AFL-CIO v. OSHA, 965 F.2d 962 (11th Cir., 1992).

Appropriate engineering controls

**Engineering Controls** Local exhaust ventilation to prevent accumulation of high concentrations and maintain air-oxygen levels at or above 19.5%. Oxygen detectors should be used when asphyxiating gases may be released. Systems under pressure should be regularly checked for leakages.

Individual protection measures, such as personal protective equipment

**Eye/face protection** Wear safety glasses with side shields (or goggles).

**Skin and body protection** Work gloves and safety shoes are recommended when handling cylinders.

**Respiratory protection** Use positive pressure airline respirator with escape cylinder or self contained breathing apparatus for oxygen-deficient atmospheres (<19.5%). If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

Information on basic physical and chemical properties

**Product Level Information:**

Physical state	Compressed gas
Appearance	Colorless.
Odor	Odorless.
Odor threshold	No information available
pH	No data available
Melting point	No data available
Evaporation rate	Not applicable
Lower flammability limit:	Not applicable
Upper flammability limit:	Not applicable
Flash point	Not applicable.
Autoignition temperature	No data available
Decomposition temperature	No data available
Partition coefficient	No data available
Kinematic viscosity	Not applicable

Chemical Name	Molecular weight	Boiling point	Vapor Pressure	Vapor density (air =1)	Gas Density kg/m <sup>3</sup> @20°C	Critical Temperature
Argon	39.95	-185.9 °C	Above critical temperature	1.38	1.65	-122.3 °C
Carbon dioxide	44.01	-78.5 °C	838 psig (5778	1.522	1.839	31.1 °C

		(Sublimes)	kPa) @ 21.1°C			
Oxygen	31.99	-182.9 °C	Above critical temperature	1.11	1.331	-118.6 °C

## 10. STABILITY AND REACTIVITY

### Reactivity

Not reactive under normal conditions

### Chemical stability

Stable under normal conditions.

### Explosion data

Sensitivity to Mechanical Impact      None.

Sensitivity to Static Discharge          None.

### Possibility of Hazardous Reactions

None under normal processing.

### Conditions to avoid

Due to the presence of Carbon dioxide, Carbonic acid is formed in the presence of moisture.

### Incompatible materials

Carbon dioxide is incompatible with: Certain reactive metals, hydrides, moist cesium monoxide, or lithium acetylene carbide diammino may ignite. Passing carbon dioxide over a mixture of sodium peroxide and aluminum or magnesium may explode.

### Hazardous Decomposition Products

None known.

## 11. TOXICOLOGICAL INFORMATION

### Information on likely routes of exposure

Inhalation	Acidosis, adrenal cortical exhaustion, and other metabolic stresses have resulted from prolonged continuous exposure to 1-2% carbon dioxide (10,000 ppm-20,000 ppm). The ACGIH TLV of 5,000 ppm is expected to provide a good margin of safety from asphyxiation and undue metabolic stress provided sufficient oxygen levels are maintained in the air. Increased physical activity, duration of exposure, and decreased oxygen content can affect systemic and respiratory effects resulting from exposure to carbon dioxide. Product is a simple asphyxiant.
Skin contact	No data available.
Eye contact	No data available.
Ingestion	Not an expected route of exposure.

### Information on toxicological effects

Symptoms	Simple asphyxiant. May cause suffocation by displacing the oxygen in the air. Exposure to oxygen-deficient atmosphere (<=18%) may cause dizziness, drowsiness, nausea, vomiting, excess salivation, diminished mental alertness, loss of consciousness and death. Exposure to atmospheres containing 8-10% 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. Depending on concentration and duration of exposure to carbon dioxide may cause increased respirations, headache, mild narcotic effects, increased blood pressure and pulse, and asphyxiation. Symptoms of overexposure become more apparent when atmospheric oxygen is decreased to 15-17%.
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TDG

UN/ID no. UN1956  
 Proper shipping name Compressed gas, n.o.s.  
 Hazard Class 2.2  
 Description UN1956, Compressed gas, n.o.s.(Argon, Carbon Dioxide), 2.2

MEX

UN/ID no. UN1956  
 Proper shipping name Compressed gas, n.o.s.  
 Hazard Class 2.2  
 Description UN1956, Compressed gas, n.o.s. (Argon, Carbon dioxide), 2.2

IATA

UN/ID no. UN1956  
 Proper shipping name Compressed gas, n.o.s.  
 Hazard Class 2.2  
 ERG Code 2L  
 Description UN1956, Compressed gas, n.o.s. (Argon, Carbon dioxide), 2.2

IMDG

UN/ID no. UN1956  
 Proper shipping name Compressed gas, n.o.s.  
 Hazard Class 2.2  
 EmS-No. F-C, S-V  
 Special Provisions 274  
 Description UN1956, Compressed gas, n.o.s. (Argon, Carbon dioxide), 2.2

ADR

UN/ID no. UN1956  
 Proper shipping name Compressed gas, n.o.s.  
 Hazard Class 2.2  
 Classification code 1A  
 Tunnel restriction code (E)  
 Special Provisions 274, 655  
 Description UN1956, Compressed gas, n.o.s. (Argon, Carbon dioxide), 2.2, (E)

**15. REGULATORY INFORMATION**

International Inventories

TSCA Complies  
 DSL/NDSL Complies  
 EINECS/ELINCS Complies

Legend:

TSCA - United States Toxic Substances Control Act Section 8(b) Inventory  
 DSL/NDSL - Canadian Domestic Substances List/Non-Domestic Substances List  
 EINECS/ELINCS - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances

US Federal Regulations

SARA 313

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372.

SARA 311/312 Hazard Categories

Acute Health Hazard No  
 Chronic Health Hazard No



Fire Hazard	No
Sudden release of pressure hazard	Yes
Reactive Hazard	No

CERCLA

This material, as supplied, does not contain any substances regulated as hazardous substances under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302) or the Superfund Amendments and Reauthorization Act (SARA) (40 CFR 355). There may be specific reporting requirements at the local, regional, or state level pertaining to releases of this material.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)

This product does not contain any substances regulated as hazardous air pollutants (HAPS) under Section 112 of the Clean Air Act Amendments of 1990.

CWA (Clean Water Act)

This product does not contain any substances regulated as pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42)

Risk and Process Safety Management Programs

This material, as supplied, does not contain any regulated substances with specified thresholds under 40 CFR Part 68. This product does not contain any substances regulated as Highly Hazardous Chemicals pursuant to the 29 CFR Part 1910.110.

US State Regulations

California Proposition 65

This product does not contain any Proposition 65 chemicals

U.S. State Right-to-Know Regulations

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Argon 7440-37-1	X	X	X
Carbon dioxide 124-38-9	X	X	X
Oxygen 7782-44-7	X	X	X

Chemical Name	Carcinogenicity	Exposure Limits
Carbon dioxide	-	Mexico: TWA= 5000 ppm Mexico: TWA= 9000 mg/m <sup>3</sup> Mexico: STEL= 15000 ppm Mexico: STEL= 27000 mg/m <sup>3</sup>

**16. OTHER INFORMATION**

<u>NFPA</u>	Health hazards 0	Flammability 0	Instability 0	Physical and Chemical Properties Simple asphyxiant
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Note: Ratings were assigned in accordance with Compressed Gas Association (CGA) guidelines as published in CGA Pamphlet P-19-2009, CGA Recommended Hazard Ratings for Compressed Gases, 3rd Edition.

Issue Date	06-May-2015
Revision Date	06-May-2015

Revision Note

Initial Release

General Disclaimer

For terms and conditions, including limitation of liability, please refer to the purchase agreement in effect between Linde LLC, Linde Merchant Production, Inc. or Linde Gas North America LLC (or any of their affiliates and subsidiaries) and the purchaser.

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End of Safety Data Sheet