FRESHLINE ™ 50% CO2 IN N2

SECTION 1: CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Identifier : FRESHLINE™ 50% CO2 IN N2

Chemical Formula : CO2 + N2

Refer to section 3 for REACH information

Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Food Application/s or Industries and Professional use. Perform risk assessment prior to use.

Restrictions on use : Not for consumer use

Details of the supplier of the safety data sheet

Physical address : Air Products South Africa (Pty) Ltd.
Silver Stream Business Park, 1st Floor, Building 3,
10 Muswell Road South,
Bryanston, 2191

Telephone : +27 (0)11 570 5000 (Head Office)
+27 (0)11 977 6444 (Customer Care Cylinders)
0800 023 298 (Engineering / Bulk Services)

Emergency telephone number (24h) : 0800 650 315

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

Gases under pressure – Compressed gas. H280: Contains gas under pressure; may explode if heated

Label elements

Hazard pictogram/symbols

Signal Word : Warning

Hazard Statements:

H280: Contains gas under pressure; may explode if heated

Precautionary Statements:

Storage : P403: Store in a well-ventilated area

Other hazards

High pressure gas.

Can cause rapid suffocation.

Self-contained breathing apparatus (SCBA) may be required.

Environmental Effects

Not harmful.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Substances : Not applicable

Mixtures

Components	EINECS/ELINCS Number	CAS Number	Concentration (Volume)
Carbon dioxide	204-696-9	124-38-9	50%
Nitrogen	231-783-9	7727-37-9	50%

Components	Classification (CLP)	REACH Reg. #
Carbon dioxide	Press. Gas (Comp.); H280	*1
Nitrogen	Press. Gas (Comp.); H280	*1

*1: Listed in Annex IV/V REACH, exempted from registration

*2: Registration not required: Substance manufactured or imported

*3: Registration not required: substance manufactured or imported < 1 t/y for non-intermediate uses.

Concentration is nominal. For the exact product composition, please refer to Air Products product specifications.

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General advice : Move 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 case of direct contact with eyes, get medical advice

Skin contact : Adverse effects not expected from this product.

Ingestion : Ingestion is not considered a potential route of exposure.

Inhalation : Move to fresh air. If breathing has stopped or is laboured, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. In case of shortness of breath, give oxygen.

Most important symptoms and effects, both acute and delayed

Symptoms : Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration. Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness

Indication of any immediate medical attention and special treatment needed

Treatment : If exposed or concerned: Get medical attention/advice.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media : The product itself does not burn. Use extinguishing media appropriate for surrounding fire.

Extinguishing media which must not be used for safety reasons : Do not use water jet to extinguish.

Special hazards arising from the substance or mixture

Upon exposure to intense heat or flame, cylinder will vent rapidly and or rupture violently. Product is non-flammable and does not support combustion. Move away from container and cool with water from a protected position. Keep containers and surroundings cool with water spray.

Advice for fire-fighters : Wear self-contained breathing apparatus for fire-fighting if necessary. Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire-fighters. Standard EN 137 – Self-contained open-circuit compressed air breathing apparatus with full face mask. Standard EN 469 – Protective clothing for fire-fighters. Standard EN 659 – Protective gloves for fire-fighters.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Monitor carbon dioxide level. Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level. Evacuate personnel to safe areas. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Monitor oxygen level. Ventilate the area.

Environmental precautions : Do not discharge into any place where its accumulation could be dangerous. Prevent further leakage or spillage if safe to do so.

Methods and materials for containment and cleaning up : Ventilate the area.

Additional advice : If possible, stop flow of product. Increase ventilation to the release area and monitor oxygen level. If leak is from cylinder or cylinder valve, call the Air Products emergency telephone number. If the leak is in the user's system, close the cylinder valve, safely vent the pressure, and purge with an inert gas before attempting repairs.

Reference to other sections : For more information refer to Section 8 and 13.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Cylinders should be stored up right with valve protection guard in place and firmly secured to prevent falling or being knocked over. Use equipment rated for cylinder pressure. Protect cylinders from physical damage; do not drag, roll, slide or drop. Do not allow storage area temperature to exceed 50°C. Only experienced and properly instructed persons should handle compressed gases/cryogenic liquids. Before using the product, determine its identity by reading the label. Know and understand the properties and hazards of the product before use. When doubt exists as to the correct handling procedure for a particular gas, contact the supplier. Do not remove or deface labels provided by the supplier for the identification of the cylinder contents. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Do not remove valve guards. 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. Ensure the complete gas system is compatible for pressure rating and materials of construction.

Ensure the complete gas system has been checked for leaks before use. 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. Never insert an object (e.g., spanner/wrench, screwdriver, pry bar, etc.) into valve openings. Doing so may damage valve, causing a leak.

Open valve slowly. If user experiences any difficulty operating cylinder valve discontinue use and contact supplier. 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. Close valve after each use and when empty. Do not subject containers to abnormal mechanical shocks which may cause damage to their valve or safety devices. Never attempt to lift a cylinder by its valve guard. Do not use containers as rollers or supports or for any other purpose than to contain the gas as supplied. Never strike an arc on a compressed gas cylinder or make a cylinder a part of an electrical circuit. Do not smoke while handling product or cylinders. Never re-compress a gas or a gas mixture without first consulting the supplier. Never attempt to transfer gases from one cylinder/container to another. Always use backflow protective device in piping. Never use direct flame or electrical heating devices to raise the pressure of a container. Containers should not be subjected to temperatures above 50°C. Prolonged periods of cold temperature below -30°C should be avoided.

Conditions for safe storage, including any incompatibilities

Full containers should be stored so that oldest stock is used first. Containers should be stored in a purpose built compound which should be well ventilated, preferably in the open air. Stored containers should be periodically checked for general condition and leakage. Observe all regulations and local requirements regarding storage of containers.

Protect containers stored in the open against rusting and extremes of weather. Containers should not be stored in conditions likely to encourage corrosion. Containers should be stored in the vertical position and properly secured to prevent toppling. The container valves should be tightly closed and where appropriate valve outlets should be capped or plugged. Container valve guards or caps should be in place. Keep containers tightly closed in a cool, well-ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Full and empty cylinders should be segregated. Do not allow storage temperature to exceed 50°C. Return empty containers in a timely manner.

Technical measures/Precautions

Containers should be segregated in the storage area according to the various categories (e.g. flammable, toxic, etc.) and in accordance with local regulations. Keep away from combustible material.

SECTION 8: EXPOSURE CONTROLS AND PERSONAL PROTECTION

Control parameters

Exposure limit(s)

Carbon dioxide	Time Weighted Average (TWA): EH40 WEL	5,000 ppm	9,150 mg/m^3
Carbon dioxide	Short Term Exposure Limit (STEL): EH40 WEL	15,000 ppm	27,400 mg/m^3
Carbon dioxide	Time Weighted Average (TWA): EU ELV	5,000 ppm	9,000 mg/m^3

Exposure controls

Engineering measures

Provide natural or mechanical ventilation to prevent accumulation above exposure limits. Provide natural or mechanical ventilation to prevent oxygen deficient atmospheres below 19.5% oxygen.

Personal protective equipment

Respiratory protection : 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. Users of breathing apparatus must be trained.

Hand protection : Wear sturdy work gloves when handling cylinders. Standard EN 388- Protective gloves against mechanical risk. The breakthrough time of the selected glove(s) must be greater than the intended use period.

Eye/face protection : Safety glasses recommended when handling cylinders. Standard EN 166-Personal eye-protection.

Skin and body protection: Safety shoes are recommended when handling cylinders. Standard EN ISO 20345- Personal protective equipment-Safety footwear.

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

Remarks : Simple asphyxiant.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Form	:	Compressed gas.
Colour	:	Colourless gas
Odour	:	None. Mixture contains one or more components which have no odour warning properties
Molecular Weight	:	36.00 g/mol
Relative vapour density	:	1.25 (air = 1) Heavier than air.
Relative density	:	Not applicable
Vapour pressure	:	No data available
Density	:	0.0015 g/cm^3 Note: (as vapour)
Specific Volume	:	0.70 m^3/kg
Melting/freezing point	:	No data available
Boiling point/range	:	- 98.6 °C
Water solubility	:	Not known, but considered to have low solubility.
Partition coefficient n-octanol/water [log Kow]	:	Not known
Ph	:	Not applicable
Viscosity	:	No reliable data available
Particle characteristics	:	Not applicable
Upper and Lower explosion/ flammability limits	:	Non flammable
Flash point	:	Not applicable
Auto-ignition temperature	:	Non flammable
Decomposition temperature	:	Not applicable

Other information

Explosive properties	:	Not applicable
Oxidizing properties	:	Not applicable
Odour threshold	:	Is subjective and inadequate to warn of overexposure
Evaporation rate	:	Not applicable
Flammability (solid, gas)	:	Refer to production classification in Section 2

Note: Properties are nominal and may vary due to the composition of the gas mixture

SECTION 10: STABILITY AND REACTIVITY

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

Chemical Stability : Stable under normal conditions.

Possibility of hazardous reactions : No data available

Conditions to avoid : None under recommended storage and handling conditions (see section 7).

Incompatible materials : No data available

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Likely routes of exposure

Effects on Eye	:	In case of direct contact with eyes, seek medical advice
Effects on Skin	:	Adverse effects not expected from this product
Inhalation effects	:	Concentration of 10% CO2 or more can produce unconsciousness or death. Unlike simple asphyxiants, carbon dioxide has the ability to cause death even when normal oxygen levels (20-21%) are maintained. Carbon dioxide is physiologically active, affective circulation and breathing. At concentrations between 2 and 10%, carbon dioxide can cause nausea, dizziness, headache, mental confusion, increased blood pressure and respiratory rate. In high concentrations may cause asphyxiation. Asphyxiation may bring about unconsciousness without warning and so rapidly that victim may be unable to protect themselves
Ingestion effects	:	Ingestion is not considered a potential route of exposure
Symptoms	:	Exposure to oxygen deficient atmosphere may cause the following symptoms: Dizziness. Salivation. Nausea. Vomiting. Loss of mobility/consciousness. Shivering fit. Sweating. Blurred vision. Headache. Increased pulse rate. Shortness of breath. Rapid respiration.

Acute toxicity

Acute oral toxicity : No data available on the product itself

Acute inhalation toxicity : Unlike simple asphyxiants, carbon dioxide has the ability to cause death even in normal oxygen levels (20-21%) are maintained. 5% CO2 has been found to act synergistically to increase the toxicity of certain other gases (CO, NO2) CO2 has been shown to enhance the production of carboxy-or met- haemoglobin by these gases possibly due to carbon dioxide's stimulatory effects on the respiratory and circulatory systems.

Acute dermal toxicity : No data available on the product itself

Skin corrosion/irritation : No data available

Serious eye damage / Irritation : No data available

Sensitization : No data available

Chronic toxicity or effects from long term exposure

Carcinogenicity : No data available

Reproductive toxicity : No data available on the product itself

Germ cell mutagenicity : No data 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

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Aquatic toxicity : No data is available on the product itself.

Toxicity to fish-components

Carbon dioxide	LC50(1h): 240mg/l	Species: Rainbow trout (Oncorhynchus mykiss).
Carbon dioxide	LC50(96h): 35mg/l	Species: Rainbow trout (Oncorhynchus mykiss).

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

Persistence and degradability

No data available

Bioaccumulative potential : Refer to section 9 "Partition Coefficient (n-octanol / water)".

Mobility in soil : Because of its high volatility, the product is unlikely to cause ground pollution

Other adverse effects

When discharged in large quantities may contribute to the greenhouse effect.

Effect on the ozone layer : No known effects from this product.

Ozone Depleting Potential : None

Effect on global warming : When discharged in large quantities may contribute to the greenhouse effect.

Global Warming Potential : 1 (Carbon dioxide)

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods : Contact supplier if guidance is required. Return unused product in original cylinder to supplier.

Contaminated packaging : Return cylinder to supplier.

SECTION 14: TRANSPORT INFORMATION

ADR

UN/ID No. : UN1956

Proper shipping name : COMPRESSED GAS, N.O.S. (Carbon dioxide, Nitrogen)

Class or Division : 2

Tunnel Code : (E)

Label(s) : 2.2

ADR/RID Hazard ID no. : 20

Marine Pollutant : No

IATA

UN/ID No. : UN1956

Proper shipping name : Compressed gas, n.o.s. (Carbon dioxide, Nitrogen)

Class or Division : 2.2

Label(s) : 2.2

Marine Pollutant : No

IMDG

UN/ID No. : UN1956

Proper shipping name : COMPRESSED GAS, N.O.S. (Carbon dioxide, Nitrogen)

Class or Division : 2.2

Label(s) : 2.2

Marine Pollutant : No

Segregation Group : None

RID

UN/ID No.	:	UN1956
Proper shipping name	:	COMPRESSED GAS, N.O.S. (Carbon dioxide, Nitrogen)
Class or Division	:	2
Label(s)	:	2.2
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. Ensure compliance with applicable regulations.

Before transporting product containers ensure that they are firmly secured and cylinder valve is closed and not leaking, valve outlet cap nut or plug (where provided) is correctly fitted and valve protection device (where provided) is correctly fitted.

The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact an Air Products customer service representative.

SECTION 15: REGULATORY INFORMATION

OHS Act	:	Occupational Health and Safety Act 85 of 1993 (and Regulations)
SANS 11014	:	Safety data sheet for chemical products- Content and order of sections
SANS 10234	:	Globally Harmonized System of classification and labelling of chemicals (GHS)
SANS 10265:1999	:	The classification and labelling of dangerous substances and preparations for sale and handling
SANS 10019:2008	:	Transportable containers for compressed, dissolved and liquefied gases – Basic design, manufacture, use and maintenance
SANS 1518:2008	:	Transport of dangerous goods – Design, construction, testing, approval and maintenance of road vehicles and portable tanks
SANS 10228:2010	:	The identification and classification of dangerous goods for transport
SANS 10229-1&2:2010	:	Transport of dangerous goods – Packaging and large packaging for road and rail transport Part 1: Packaging / Part 2: Large Packaging

N.B Refer to latest edition

SECTION 16: OTHER INFORMATION

Ensure all national/local regulations are observed.

Hazard Statement

H280: Contains gas under pressure; may explode if heated

Indication of Method

Gases under pressure. Compressed gas. Contains gas under pressure; may explode if heated.

Abbreviations and acronyms

ATE – Acute Toxicity Estimate
CLP – Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
REACH – Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
EINECS – European Inventory of Existing Commercial Chemical Substances
ELINCS – European List of Notified Chemical Substances
CAS# - Chemical Abstract Service number
PPE – Personal Protective Clothing
Kow – octanol-water partition coefficient
LC50- Lethal Concentration to 50% of a test population
LD50 – Lethal Dose to 50% of a test population (Median Lethal Dose)
OEL – Occupational Exposure Limit
PBT – Persistent Bioaccummulative and Toxic
vPvB - Very Persistent and Very Bioaccummulative
STOT – Specific Target Organ Toxicity
EN – European Standard
UN – United Nations
ADR – European Agreement concerning the International Carriage of Dangerous Goods by Road
IATA – International Air Transport Association
IMDG – International Maritime Dangerous Goods
RID – Regulations concerning the International Carriage of Dangerous Goods by Rail

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.

(Reference www.airproducts.com Air Products PLC FRESHLINE ® 50% CO2 IN N2 MSDS Number 300000002603 / Version 2.1 / Revision Date 24.03.2020)