

**SAFETY DATA SHEET (SDS)
REFRIGERANT R410A**

Please ensure that this SDS is received by the appropriate persons


Review Date: 29/10/2021 v01

Emergency: 0860 02 02 02

Document Number: AFX-SDS-0063

1. PRODUCT AND COMPANY IDENTIFICATION

Product	R 410A
Chemical Formula	CH ₂ F ₂ , CHF ₂ CF ₃
Trade Name	Difluoromethane, Pentafluoroethane
Colour Coding	Corn flower blue (NCS1746-R89B) body Rose (S1040-R20B) Cylinder shoulder plus Valve guard inside & outside
Product Code	W341134
Company Identification	African Oxygen Limited Grayston Office Park Building 7 128 Peter Road Sandown, Sandton, 2196 Tel. No: (011) 490-0400 Fax No: (011) 490-0530 Email: customer.service@afrox.linde.com www.afrox.com
Emergency Numbers	0860 02 02 02 (Afrox)

Skin Contact	- Vapour - unknown effect
Ingestion	Liquid - see vapour inhalation above
GHS Classification	Gas under pressure (Liquefied gas)
GHS Pictogram	
GHS Signal Words	Warning
GHS Hazard Statements	-H280: Contains gas under pressure, may explode if heated
GHS Precautionary Statements	Storage: - P410+P403 : Protect from sunlight and store in a well-ventilated place. Prevention: - None Response: - None Disposal: - None

2. HAZARD IDENTIFICATION

Classification	- Classification under South African Hazardous Chemical Substances Regulations subsequently amended. (HCS) - Classification under the Globally Harmonized System of classification and labelling of chemicals (GHS)
Emergency Overview	Colour: Colourless Odour: Ethereal and faint sweetish Taste: Not available Physical State: Volatile liquid Form: Gas under pressure

Other Hazards that do not result in classification	- Liquid can cause burns similar to frostbite - May displace oxygen and cause rapid suffocation - Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials. - Contains fluorinated greenhouse gases
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Main Hazards	- Contains a liquefied gas. Contact of liquid health effects may cause frostbite and injury to the cornea - In high concentrations may cause asphyxiation
Adverse Health Effects	- Overexposure may cause dizziness and loss of concentration - At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces.
Chemical Hazards	- Heating will cause a rise in pressure with a risk of bursting. On Combustion, toxic gases are released
Biological Hazards	- Contact with liquid could cause frost burns
Vapour Inhalation	- High exposures may cause an abnormal heart rhythm and prove suddenly fatal. May have a narcotic effect, very high concentrations may cause anaesthetic effects and asphyxiation
Eye Contact	- Vapour - unknown effect - Liquid - could cause serious burns

3. COMPOSITION OF INGREDIENTS

Chemical name	A preparation of Difluoromethane
CAS No	Difluoromethane 75-10-5 Pentafluoroethane 354-33-6
UN No	1078
ERG No	2L
Hazard class	2 TE
Hazchem Warning	2C non-flammable, nontoxic gas

4. FIRST AID

GHS Hazard Statements	-H280: Contains gas under pressure, may explode if heated
GHS Precautionary Statements	Storage: - P410+P403 : Protect from sunlight and store in a well-ventilated place. Prevention: - None Response: - None Disposal: - None

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Other Hazards that do not result in classification	<ul style="list-style-type: none"> - Liquid can cause burns similar to frostbite - May displace oxygen and cause rapid suffocation - Store away from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials.
Inhalation	<ul style="list-style-type: none"> - Contains fluorinated greenhouse gases - Remove patient from exposure, keep warm and at rest. Administer oxygen if necessary - Apply artificial respiration if breathing has ceased or shows signs of failing. In the event of cardiac arrest apply external Cardiac massage. Obtain immediate medical attention.

5. FIRE-FIGHTING

Suitable extinguishing media	-As R410A is non-flammable, use extinguishing media appropriate for surrounding fire.
Unsuitable extinguishing media:	-None
Specific Hazards	<ul style="list-style-type: none"> - Fire or excessive heat may produce hazardous decomposition products. - Heat may cause the containers to explode.
Special fire fighting procedures:	- 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 containers from area of fire if safe to do so.
Special protective equipment for firefighters:	- Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, Self-contained Breathing Apparatus.

6. ACCIDENTAL RELEASE

Personal precautions, protective equipment and emergency procedures:	<ul style="list-style-type: none"> - Evacuate area. Provide adequate ventilation. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. - Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe.
Environmental Precautions	- Prevent further leakage or spillage if safe to do so.
Methods and material for containment and cleaning up:	- Provide adequate ventilation.

7. HANDLING AND STORAGE

Safe Handling	<ul style="list-style-type: none"> - Only experienced and properly instructed persons should handle gases under pressure. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Refer to supplier's handling instructions. The substance must be handled in accordance with good industrial hygiene and safety procedures. Protect containers from physical damage; do not drag, roll, slide or drop. Do not remove or deface labels provided by the supplier for the identification of the container contents. When moving containers, even for short distances, use appropriate equipment eg. trolley, hand truck, fork truck etc. Secure cylinders in an upright position at all times, close all valves when not in use. Provide adequate ventilation. Suck back of water into the container must be prevented. Do not allow back feed into the container. Avoid suck back of water, acid and alkalis. Keep container below 50°C in a well-ventilated place. Observe all regulations and local requirements regarding storage of containers. When using do not eat, drink or smoke. Store in accordance with. Never use direct flame or electrical heating devices to raise the pressure of a container. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. Damaged valves should be reported immediately to the 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. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminates particularly oil and water. If user experiences any difficulty operating container valve discontinue use and contact supplier. Never attempt to transfer gases from one container to another. Container valve guards or caps should be in place.
Conditions for safe storage, including any incompatibilities	<ul style="list-style-type: none"> - Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from

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sources of heat and ignition. Keep away from combustible material.

-Do not allow cylinders to slide or come into contact with sharp edges. R134a cylinders should be stacked vertically at all times and should be firmly secured in order to prevent them from being knocked over. Use a "first in - first out" inventory system to prevent full cylinders from being stored for excessive periods of time. Keep out of reach of children

Technical Measures/ Storage conditions

- Freshly abraded aluminium surfaces at specific temperatures and pressures may cause a strong exothermic reaction.
- Chemically reactive metals: potassium, calcium, powdered aluminium, magnesium, and zinc
- Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty

8. EXPOSURE CONTROLS

Occupational Exposure Hazards

- TWA 1000ppm
- As R410A is a simple asphyxiant, avoid exposure hazards any areas where spillage has taken place. Only enter once testing has proved the atmosphere to be safe, and remember that the gas is heavier than air

Engineering Control Measures

- Engineering control measures are preferred to reduce 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

- A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk.

Eyes

- Wear eye protection to EN 166 when using gases.

Hands

- Wear working gloves while handling containers

Body protection: Feet

- No special precautions.
- Wear safety shoes while handling containers

9. PHYSICAL AND CHEMICAL PROPERTIES

Name	R410A
Chemical Symbol	C2H2F4 CHF2CF3
Physical state	Gas
Form:	Liquefied gas
Colour:	C2HF5: Colourless CH2F2: Colourless
Odour:	C2HF5: faint ethereal CH2F2: Odourless
Odour Threshold:	Odour threshold is subjective and is inadequate to warn of over-exposure.
pH:	Not applicable.
Melting Point:	No data available.
Boiling Point:	-51.4 °C
Sublimation Point:	Not applicable.
Critical Temp. (°C):	72.1 °C
Flash Point:	Not applicable
Evaporation Rate:	Not applicable.
Flammability (solid, gas):	Non-flammable Gas
Flammability limit - upper (%):	Not applicable.
Flammability limit - lower(%):	Not applicable.
Vapour pressure:	1,657.4 kPa (25 °C)
Vapour density (air=1)	2.55 (calculated) (15 °C)
Relative density:	No data available.
Solubility(ies)	
Solubility in Water:	No data available.
Partition coefficient (n-octanol/water):	Not known
Autoignition Temperature:	Not applicable.
Decomposition Temperature:	No data available
Viscosity	
Kinematic viscosity:	No data available.
Dynamic viscosity:	No data available.
Explosive properties:	Not applicable
Oxidising Properties:	Not applicable
Molecular weight	72.6 g/mol

10. STABILITY AND REACTIVITY

Reactivity	- No reactivity hazard other than the effects described in sub-sections below.
Chemical stability	- Stable under normal conditions.
Possibility of hazardous reactions	- None.
Conditions to avoid	- Open flames and high energy ignition sources. The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain

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mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions

Incompatible Materials -No reaction with any common materials in dry or wet conditions. Alkali metals. Alkali earth metals. Chemically active metals (such as calcium, powdered aluminium, zinc, and magnesium)

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

11. TOXICOLOGICAL INFORMATION

Acute Toxicity TWA 1000 ppm
Skin & eye contact No known effect
Chronic Toxicity No known effect
Carcinogenicity No known effect
Mutagenicity No known effect
Reproductive Hazards No known effect
Other Relevant Toxicity Information Cardiac sensitisation threshold limit >350000 ppm
 Beagle (dog)NOAEC

Cardiac sensitisation threshold limit 350000 ppm
 Beagle (dog)LOAEC

Light hydrocarbons like this one have been associated with cardiac sensitisation in abuse situations. Hypoxia or the injection of adrenaline-like substances enhances these effects. May produce irregular heartbeat and nervous symptoms.

Pentafluoroethane Cardiac sensitisation threshold limit 100000 ppm
 Beagle (dog)NOAEC

Cardiac sensitisation threshold limit 75000 ppm
 Beagle (dog)LOAEC

Light hydrocarbons like this one have been associated with cardiac sensitisation in abuse situations. Hypoxia or the injection of adrenaline-like substances enhances these effects. May produce irregular heart beat and nervous symptoms.

12. ECOLOGICAL INFORMATION

Toxicity - No known ecological damage caused by this product.
Persistence and degradability - Not applicable to gases and gas mixtures.
Mobility in soil - No information available
Ecology - soil - Because of its high volatility, the product is unlikely to cause ground or water pollution.
Results of PBT and vPvB assessment - Not classified as persistent, bioaccumulating and toxic (PBT).
 - Not classified as persistent, very persistent and very bioaccumulating (vPvB).
Other adverse effects - May cause pH changes in aqueous ecological systems.
Effect on ozone layer - None
Effect on the global warming - Global warming potential: 2,087.8
 - Contains Fluorinated greenhouse gases covered by the Kyoto protocol.
 - When discharged in large quantities may contribute to the greenhouse effect.

13. DISPOSAL CONSIDERATIONS

Disposal Methods - Do not attempt to dispose of residual or unused quantities
Disposal of Packaging - Return container to supplier.

14. TRANSPORT INFORMATION

Road Transportation

UN No. 1078
Shipping Name Refrigerant gas
ERG No. 2L
Class 2.2
Subsidiary Risk Not applicable
Hazchem Warning 2 C Non-flammable gas

Sea Transportation

IMDG 1078
Shipping Name Refrigerant gas
ERG No. 2L
Class 2.2
Subsidiary Risk Not applicable
Label Non-flammable gas nontoxic gas

Air Transportation

ICAO/IATA Code 1078
Class 2.2
Subsidiary risk Not applicable
Packaging instructions - Cargo: 200
 - Passenger: Forbidden
Maximum quantity allowed - Cargo: 150 kg
 - Passenger: Forbidden

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15. REGULATORY INFORMATION

SANS 11014:2010 Edition 1	Safety data sheet for chemical products - Content and order of sections
SANS 10228:2012 Edition 6	The identification and classification of dangerous goods for transport by road and rail modes
SANS 10234:2019 Edition 2	Globally Harmonized System of classification and labelling of chemicals (GHS)
SUPPLEMENT TO SANS 10234 Edition 1	List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)

16. OTHER INFORMATION

- Ensure all national/local regulations are observed.
- Ensure users and relevant persons understand the asphyxiation hazard
- Regularly check supplier's information sources for updated versions of SDS's
- SANS 10234-Globally Harmonized System of Classification and Labelling of Chemicals and Matheson Gas data book
Revision Date 29/10/2021 v01

Bibliography

Matheson Gas Data Book, 7th Edition.
National Institute for Standards and Technology (NIST)
Standard Reference Database Number 69.
The ESIS (European chemical Substances 5 Information System) platform of the former European Chemicals Bureau (ECB) ESIS (<http://ecb.jrc.ec.europa.eu/esis/>).
The European Chemical Industry Council (CEFIC)
ERICards.
United States of America's National Library of Medicine's toxicology data network
TOXNET (<http://toxnet.nlm.nih.gov/index.html>)

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