

SAFETY DATA SHEET (SDS)

R427A

Please ensure that this SDS is received by the appropriate persons

Review Date: 15/8/2023 v01

Emergency: 0860 02 02 02


Document Number: AFX-SDS-0047

1. PRODUCT AND COMPANY IDENTIFICATION

Product Synonym	R427A REFRIGERANT R427A
Chemical Formula	C2H3F3 C2HF5 CH2F2 C2H2F4
Trade Name	R427A cylinder 10Kg R427A cylinder 59Kg R427A drum 800Kg
Colour Coding	Corn flower blue
Product Code	578042-LA-N 578042-LG-N 578042-TA-N
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)

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: None - Odour: None - Taste: None - Physical State: Compressed Gas - Form: Gas under pressure
Main Hazards	- All cylinders are portable gas containers and must be regarded as pressure vessels at all times. - R427A does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in air below the levels necessary to support life. As it is heavier than air it will tend to concentrate at lower levels
Adverse Health Effects	- None
Chemical Hazards	- R427A is relatively non-reactive and non-toxic
Biological Hazards	- The greatest physiological effect of R427A is asphyxiation
Vapour Inhalation	- Asphyxiation
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	Prevention: P280 : Wear protective gloves/eye protection/face protection Response: None Storage: P403: Store in a well-ventilated place P410: Protect from sunlight Disposal Return to supplier for destruction
Other Hazards that do not result in classification	- May cause frostbite or freezing of skin - Will displace oxygen in an enclosed space - Asphyxiant in high concentrations - Contains fluorinated greenhouse gases

3. COMPOSITION OF INGREDIENTS

Chemical name	R125
Chemical family	Pentafluoroethane
CAS No	354-33-6
UN No	3220
ERG No	126
Hazard class	2.2
Hazchem Warning	Non-flammable Non-toxic Gas
Chemical name	R134a 1,1,1,2 Tetrafluoroethane
Chemical family	
CAS No	811-97-2
UN No	3159
ERG No	126
Hazard class	2.2
Hazchem Warning	Non-flammable Non-toxic
Chemical name	R143a 1,1,1 Trifluoroethane
Chemical family	
CAS No	420-46-2
UN No	2035
ERG No	115
Hazard class	2.1
Hazchem Warning	Flammable non-toxic
Chemical name	R32 Difluoromethane
Chemical family	
CAS No	75-10-5
UN No	3252
ERG No	115
Hazard class	2.2
Hazchem Warning	Flammable Non-toxic

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4. FIRST AID MEASURES	
Eye contact	<p>The liquid may cause frostbite</p> <ul style="list-style-type: none"> - Rinse the eye with water immediately - Remove contact lenses, if present and easy to do. Continue rinsing. - Flush thoroughly with water for at least 15 minutes - Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes
Skin Contact	<p>The liquid may cause frostbite</p> <ul style="list-style-type: none"> - For exposure to liquid, immediately warm frostbite area with warm water not to exceed 41°C. Water temperature should be tolerable to normal skin - Maintain skin warming for at least 15 minutes or until normal colouring and sensation have returned to the affected area - In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible
Ingestion	<ul style="list-style-type: none"> - Ingestion is not considered a potential route of exposure
Inhalation	<ul style="list-style-type: none"> - In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation - Remove victim to uncontaminated area wearing self-contained breathing apparatus - Keep victim warm and rested. Seek medical attention. Apply artificial respiration if breathing stopped - Low concentrations of R427A cause increased respiration

5. FIRE-FIGHTING MEASURES	
Suitable extinguishing media	<ul style="list-style-type: none"> - Material will not burn. In case of fire in the surroundings: use appropriate extinguishing agent.
Unsuitable extinguishing media:	<ul style="list-style-type: none"> - None
Specific Hazards	<ul style="list-style-type: none"> - Asphyxiant - Fire or excessive heat may produce hazardous decomposition products
Special fire fighting procedures:	<ul style="list-style-type: none"> - In case of fire: Stop leak if safe to do so. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.
Special protective equipment for firefighters:	<ul style="list-style-type: none"> - Exposed Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces a self-contained breathing apparatus

6. ACCIDENTAL RELEASE MEASURES	
Personal precautions, protective equipment and emergency procedures:	<ul style="list-style-type: none"> - WARNING! Liquid and gas under pressure. Rapid release of gaseous R427A through a pressure relief device (PRD) or valve can result in the formation of cold liquid, which is very cold and can cause frostbite. - Evacuate area - Provide adequate ventilation - Prevent from entering sewers, basements and work pits, or any place where its accumulation can be dangerous - Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe - In an enclosed or non-ventilated space, a self-contained breathing apparatus must be used
Environmental Precautions	<ul style="list-style-type: none"> - Prevent further leakage or spillage if safe to do so
Methods and material for containment and cleaning up:	<ul style="list-style-type: none"> - 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 backfeed into the container. Avoid suckback 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 local/regional/national/international regulations. Never use direct flame or

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	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 were supplied as soon as container is disconnected from equipment. Keep container valve outlets clean and free from contaminants 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	-Containers should not be stored in conditions likely to encourage corrosion. Keep away from food, drink and animal feeding stuffs. 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 sources of heat and ignition. Keep pressure containers away from combustible material.

	be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD. Self-contained breathing apparatus (SCBA) or positive pressure airline with mask are to be used in oxygen-deficient atmospheres
Eyes	- Wear safety glasses when handling cylinders; vapour-proof goggles and a face shield during cylinder change-out or whenever contact with product is possible
Hands	-Guideline: Protective gloves against mechanical risks. - Additional Information: Wear working gloves while handling containers
Body protection:	-No special precautions
Feet	- Wear safety shoes while handling containers

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Name	R427A
Chemical Symbol	1,1,1,2,2 Pentafluoroethane 1,1,1,2 Tetrafluoroethane 1,1,1 Trifluoroethane Difluoromethane
Physical state	Gas
Form:	Liquefied gas
Colour:	Colourless
Odour:	Odourless
Odour Threshold:	Odor threshold is subjective and is inadequate to warn of over exposure
pH:	Not applicable
Melting Point:	Not applicable
Boiling Point:	-42,7 °C
Sublimation Point:	Not Applicable
Critical Temp. (°C):	85.3°C
Flash Point:	Not applicable
Evaporation Rate:	Not applicable
Flammability (solid, gas):	Non-Flammable Gas
Flammability limit -Lower (%):	Not applicable
Flammability limit -Upper(%):	Not applicable
Vapour pressure:	No data available
Vapour density (air=1)	4.2 (20 °C)
Relative density:	No data available
Solubility(ies)	
Solubility in Water:	No data available
Partition coefficient (n-octanol/water):	No data available
Autoignition Temperature:	Not known
Decomposition Temperature:	Not known
Viscosity	

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Occupational Exposure Hazards (HCS)	-No information available
Engineering Control Measures	- Engineering control measures are preferred to reduce exposures Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Oxygen detectors should be used when asphyxiating gases may be released. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Systems under pressure should be regularly checked for leakages. Preferably use permanent leak tight connections (eg. welded pipes). Do not eat, drink or smoke when using the product A Risk assessment should be conducted to evaluate the suitability of PPE to the task being performed
Personal Protection	- When allowed by a risk assessment Respiratory Protective Equipment (RPE) may be used. The selection of the Respiratory Protective Device (RPD) must

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Kinematic viscosity:	No data available
Dynamic viscosity:	No data available
Explosive properties:	Not applicable
Oxidising Properties:	Not applicable
Molecular weight	Not applicable

Results of PBT and vPvB assessment	Not classified as persistent, bio-accumulating and toxic (PBT). Not classified as persistent, very persistent and very bio-accumulating (vPvB)
Other adverse effects	No ecological damage caused by this product
Effect on ozone layer	Zero ozone depletion
Effect on the global warming (CO₂=1)	2.138,2 times more than CO ₂

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	- Overheating of cylinders. Never use cylinders as rollers or supports; or for any other purpose than the storage of R427A - 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 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 aluminum, zinc, and magnesium)
Hazardous Decomposition of Products	- Electrical discharges and high temperatures decompose R427A into HF and F ₂

13. DISPOSAL CONSIDERATIONS

Disposal Methods	- Do not discharge into any place where its accumulation could be dangerous. Do not vent to atmosphere due to environmental impact
Disposal of Packaging	- The container is the property of the supplier and the disposal of the containers must only be handled by the supplier - Return Product & container to supplier

14. TRANSPORT INFORMATION

Road Transportation	
UN No.	3163
Shipping Name	LIQUEFIED GAS, N.O.S.(1,1,1,2-Tetrafluoroethane, Difluoromethane)
ERG No.	126
Class	2.2
Subsidiary Risk	Non-flammable, non-toxic gases
Hazchem Warning	2A Non-Flammable Gas
Sea Transportation	
IMDG	3163
Shipping Name	LIQUEFIED GAS, N.O.S.(1,1,1,2-Tetrafluoroethane, Difluoromethane)
ERG No.	126
Class	2.2
Subsidiary Risk	Non- flammable, non-toxic gases
Label	Non-flammable Gas
Air Transportation	
ICAO/IATA Code	3163
Class	2.2
Packing Group:	-
Packaging instructions	- Cargo: allowed 150kg - Passenger: allowed 75kg

11. TOXOLOGICAL INFORMATION

Acute Toxicity	Based on available data, the classification criteria are not met
Skin & eye contact	Based on available data, the classification criteria are not met
Chronic Toxicity	Based on available data, the classification criteria are not met
Carcinogenicity	Based on available data, the classification criteria are not met
Mutagenicity	Based on available data, the classification criteria are not met
Reproductive Hazards	Based on available data, the classification criteria are not met

12. ECOLOGICAL INFORMATION

Toxicity	No ecological damage caused by this product
Persistence and degradability	Not applicable to gases and gas mixtures
Bioaccumulative Potential Product	The subject product is expected to biodegrade and is not expected to persist for long periods in an aquatic environment
Mobility in soil	Because of its high volatility, the product is unlikely to cause ground or water pollution.

15. REGULATORY INFORMATION

EEC Hazard class: National legislation OHSact and Regulations 85 of 1993.	
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)

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SUPPLEMENT TO SANS 10234 Edition 1	List of classification and labelling of chemicals in accordance with the Globally Harmonized System (GHS)
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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

Revision Date	15/8/2023 v01
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Bibliography

Compressed Gas Association, Arlington, Virginia
Handbook of Compressed Gases - 3rd Edition
Matheson Gas Data Book - 6th Edition
SANS 11014 - Safety data sheet for chemical products:
Content and order of sections
SANS 10234 - List of classification and labelling of chemicals
in accordance with the Globally Harmonized System (GHS)
SANS 10265 – Classification and Labelling of Dangerous
Substances

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