

## SAFETY DATA SHEET (MSDS) REFRIGERANT R407C

Please ensure that this SDS is received by the appropriate persons

Review Date: 10/08/2023 v01

Emergency: 0860 02 02 02


Document Number: AFX-SDS-0064

### 1. PRODUCT AND COMPANY IDENTIFICATION

<b>Product</b>	R 407C Refrigerant
<b>Chemical Formula</b>	CH <sub>2</sub> F <sub>2</sub> difluoromethane (R-32) CF <sub>3</sub> CHF <sub>2</sub> pentafluoroethane (R-125) CF <sub>3</sub> CH <sub>2</sub> F 1,1,1,2-tetrafluoroethane (R-134a)
<b>Trade Name</b>	R407C Disposable cylinder 11.3Kg
<b>Colour Coding</b>	Corn flower blue (NCS1746-R89B) body Medium Brown (S 3050-Y50R) Cylinder shoulder plus Valve guard inside & outside
<b>Valve</b>	¼ inch SAE flare fitting male right hand thread
<b>Product Code</b>	W341107
<b>Company Identification</b>	Grayston Office Park Building 7, 128 Peter Road Sandown, Sandton, 2196 Tel. No: (011) 490-0400 Fax No: (011) 490-0530 Email: <a href="mailto:customer.service@afrox.linde.com">customer.service@afrox.linde.com</a> <a href="http://www.afrox.com">www.afrox.com</a>
<b>Emergency Numbers</b>	<b>0860 02 02 02</b>

### 2. HAZARD IDENTIFICATION

<b>Emergency Overview</b>	Colour: Colourless Odour: Ethereal and faint sweetish Taste: Not available Physical State: Volatile liquid Form: Gas under pressure
<b>Main Hazards</b>	Contains a liquefied gas
<b>Adverse Health Effects</b>	Contact of liquid may cause frostbite and injury to the cornea In high concentrations may cause asphyxiation
<b>Chemical Hazards</b>	Heating will cause a rise in pressure with a risk of bursting. On Combustion, toxic gases are released
<b>Biological Hazards</b>	Contact with liquid could cause frost burns
<b>Vapour Inhalation</b>	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
<b>Eye Contact</b>	Contact with liquid or vapour may cause irritation and cold burns
<b>Skin Contact</b>	May cause irritation by defatting tissue and cold burns. Necrosis from freezing tissue could occur
<b>Ingestion</b>	If swallowed discomfort in the gastrointestinal tract would result from rapid evaporation of liquid and consequent evolution of gas. Some of the effects of inhalation would be

<b>Pictogram</b>	<p>expected. Necrosis from freezing of tissue could occur</p> 
<b>Signal Word</b>	Warning
<b>Hazard Statements</b>	- H280: Contains gas under pressure; may explode if heated
<b>Precautionary Statements</b>	<b>Prevention:</b> - None <b>Response:</b> - None <b>Storage:</b> P403: Store in a well-ventilated place P410: Protect from sunlight <b>Disposal:</b> - None
<b>Other Hazards that do not result in classification</b>	- May cause frostbite - May displace oxygen and cause rapid suffocation - Contains fluorinated greenhouse gases

### 3. COMPOSITION OF INGREDIENTS

<b>Chemical name</b>	R407c
<b>CAS No</b>	difluoromethane 75-10-5 pentafluoroethane 354-33-6 1,1,1,2-tetrafluoroethane 811-97-2
<b>UN No</b>	3340
<b>ERG No</b>	126
<b>Hazard class</b>	2.2
<b>Hazchem Warning</b>	2A Non-flammable gas

### 4. FIRST AID

<p>Prompt medical attention is mandatory in all cases of overexposure to vapourised R407C. Rescue personnel should be equipped with self-contained breathing apparatus. Conscious persons should be assisted to an uncontaminated area and inhale fresh air. Quick removal from the contaminated area is most important. Unconscious persons should be removed to an uncontaminated area and given mouth-to-mouth resuscitation and supplemental oxygen. The use of adrenaline or similar drugs should be avoided</p>	
<b>Eye contact</b>	- Rinse immediately with plenty of water and continue for 15 minutes, occasionally lifting eyelids to assist irrigation. If irritation persists, contact doctor or poisons information centre
<b>Skin Contact</b>	- Wash area with warm water until chemical is removed. If there is evidence of frostbite, bathe (not rub) with lukewarm water. In the absence of water, cover with a clean, soft cloth or similar covering. If irritation persists, contact doctor or poisons information centre

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<b>Ingestion</b>	- Not Specifically applicable (gas), do not induce vomiting. If patient conscious, wash out mouth with water and give 200 - 300ml water to drink. Obtain immediate medical attention
<b>Inhalation</b>	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. Call a doctor. Apply artificial respiration if breathing stopped

<b>Large Spills</b>	- Evacuate the area. Shut off the source of the spill if this can be done without risk. Restrict access to the area until completion of the clean-up procedure. Ventilate the area using forced draft if necessary
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5. FIRE-FIGHTING	
<b>Suitable extinguishing media</b>	- Material will not burn. In case of fire in the surroundings: use appropriate extinguishing agent. Water spray, fog, CO <sub>2</sub> , dry chemical, or alcohol resistant foam
<b>Unsuitable extinguishing media:</b>	- None
<b>Specific Hazards</b>	- Fire or excessive heat may produce hazardous decomposition products - Pressurised container. On Heating there is a risk of bursting due to internal pressure build-up. NOT flammable. However, it may present a risk in the event of fire. Toxic vapours (Halogen compound) are released
<b>Emergency Actions</b>	- Stay upwind. Evacuate the personnel away from the fumes. Cool down the containers/equipment exposed to heat with a water spray - CONTACT LOCAL EMERGENCY SERVICES AND THE AFROX EMERGENCY NUMBER.
<b>Protective Clothing</b>	- Self-contained breathing apparatus. Safety gloves and shoes or boots should be worn when handling cylinders.
<b>Environmental precautions</b>	- Prevent the product from spreading into the environment

7. HANDLING AND STORAGE	
<b>Safe Handling</b>	- 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 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.
<b>Conditions for safe storage,</b>	- Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically

6. ACCIDENTAL RELEASE	
<b>Personal Precautions</b>	- 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. Respiratory protective devices - Self-contained open-circuit compressed air breathing apparatus with full face mask - Requirements, testing, marking
<b>Environmental Precautions</b>	- Prevent the product from spreading into the environment. Contain the spilled material by bunding
<b>Small Spills</b>	- Shut off source of product. Ventilate area

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<b>including any incompatibilities</b>	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 away from combustible material
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<b>8. EXPOSURE CONTROLS</b>	
<b>Occupational Exposure Hazards</b>	No information available
<b>Engineering Control Measures</b>	- 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
<b>Personal protection</b>	- Self-contained breathing apparatus should always be worn when entering area where oxygen depletion may have occurred. Safety goggles, gloves and shoes or boots should be worn when handling cylinders
<b>Eyes</b>	- Wear safety glasses when handling cylinders; vapour-proof goggles and a face shield during cylinder change-out or whenever contact with product is possible
<b>Hands</b>	- Guideline: Protective gloves against mechanical risks. Additional Information: Wear working gloves while handling containers
<b>Body protection:</b>	No special precautions
<b>Feet</b>	Wear safety shoes while handling containers

<b>9. PHYSICAL AND CHEMICAL PROPERTIES</b>	
<b>Chemical Name</b>	<b>R407c</b>
<b>Chemical Symbol</b>	CH2F2, R32 CF3CHF2, R125 CF3CH2F, R134a
<b>Physical state</b>	Gas
<b>Form:</b>	Liquefied gas
<b>Colour:</b>	Colourless
<b>Odour:</b>	Faint ethereal
<b>Odour Threshold:</b>	Odour threshold is subjective and is inadequate to warn of over-exposure
<b>pH:</b>	Not Known
<b>Melting Point:</b>	-103°C This is based on data for the following

	ingredient: pentafluoroethane. Weighted average: - 113.19°C
<b>Boiling Point:</b>	-43.6°C
<b>Sublimation Point:</b>	Not applicable
<b>Critical Temp. (°C):</b>	86.74 °C
<b>Flash Point:</b>	Not applicable
<b>Evaporation Rate:</b>	Not applicable
<b>Flammability (solid, gas):</b>	Non-flammable Gas
<b>Flammability limit - upper (%):</b>	Not applicable
<b>Flammability limit - lower(%):</b>	Not applicable
<b>Vapour pressure:</b>	Not available
<b>Vapour density (air=1)</b>	4.2
<b>Relative density:</b>	1.16 (20°C)
<b>Solubility(ies)</b>	
<b>Solubility in Water:</b>	Not available
<b>Partition coefficient (n-octanol/water):</b>	Not available
<b>Autoignition Temperature:</b>	Not applicable
<b>Decomposition Temperature:</b>	Not applicable
<b>Viscosity</b>	
<b>Kinematic viscosity:</b>	No data available
<b>Dynamic viscosity:</b>	No data available
<b>Explosive properties:</b>	Not applicable
<b>Oxidising Properties:</b>	Not applicable
<b>Molecular weight</b>	No data available

<b>10. STABILITY AND REACTIVITY</b>	
<b>Reactivity</b>	- No reactivity hazard other than the effects described in sub-sections below.
<b>Chemical stability</b>	- Stable under normal conditions.
<b>Possibility of hazardous reactions</b>	- None
<b>Conditions to avoid</b>	- 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
<b>Incompatible Materials</b>	- 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)
<b>Hazardous Decomposition of Products</b>	- Electrical discharges and high temperatures decompose R427A into HF and F <sub>2</sub> - Under normal conditions of storage and use, hazardous decomposition products should not be produced.

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**11. TOXOLOGICAL INFORMATION**

<b>Acute Toxicity</b>	Based on available data, the classification criteria are not met
<b>Skin &amp; eye contact</b>	Based on available data, the classification criteria are not met
<b>Chronic Toxicity</b>	Based on available data, the classification criteria are not met
<b>Carcinogenicity</b>	Based on available data, the classification criteria are not met
<b>Mutagenicity</b>	Based on available data, the classification criteria are not met
<b>Reproductive Hazards</b>	Based on available data, the classification criteria are not met

**12. ECOLOGICAL INFORMATION**

<b>Toxicity</b>	-No ecological damage caused by this product
<b>Persistence and degradability</b>	- R-407C is a gas at room temperature; therefore, it is unlikely to remain in water
<b>Mobility in soil</b>	- Because of its high volatility, the product is unlikely to cause ground or water pollution
<b>Results of PBT and vPvB assessment</b>	- Not classified as PBT or vPvB.
<b>Other adverse effects</b>	- Dangerous to the ozone layer - Prevent the product from spreading into the environment
<b>Effect on ozone layer</b>	- Zero ozone depletion
<b>Effect on the global warming (CO<sub>2</sub>=1)</b>	- 1,774 times more than CO <sub>2</sub>

**13. DISPOSAL CONSIDERATIONS**

<b>Disposal Methods</b>	- Do not allow the product to be released into the environment. Consult the manufacturer of supplier for information regarding recovery and recycling of the product
<b>Disposal of Packaging</b>	- Return empty containers to supplier

**14. TRANSPORT INFORMATION**

**Road Transportation**

<b>UN No.</b>	3340
<b>Shipping Name</b>	Refrigerant gas R407C
<b>ERG No.</b>	126
<b>Class</b>	2.2
<b>Subsidiary Risk</b>	Not applicable
<b>Hazchem Warning</b>	2A Non-flammable gas

**Sea Transportation**

<b>IMDG</b>	3340
<b>Shipping Name</b>	Refrigerant gas R407C
<b>ERG No.</b>	126
<b>Class</b>	2.2
<b>Subsidiary Risk</b>	Not applicable
<b>Label</b>	Non-Flammable

**Air Transportation**

<b>ICAO/IATA Code</b>	3340
<b>Class</b>	2.2
<b>Subsidiary risk</b>	Not applicable
<b>Packaging instructions</b>	- Cargo: 200 - Passenger: 150kg
<b>Maximum quantity allowed</b>	- Cargo: 150 kg - Passenger: 75kg

**15. REGULATORY INFORMATION**

<b>SANS11014:2010 Edition 1</b>	Safety data sheet for chemical products - Content and order of sections
<b>SANS 10228:2012 Edition 6</b>	The identification and classification of dangerous goods for transport by road and rail modes
<b>SANS 10234:2019 Edition 2</b>	Globally Harmonized System of classification and labelling of chemicals (GHS)
<b>SUPPLEMENT TO SANS 10234 Edition 1</b>	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** 10/08/2023 ver1

**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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