AFROX
A Member of The Linde Group

MATERIAL SAFETY DATA SHEET (MSDS)

R404A

Please ensure that this MSDS is received by the appropriate person.

DATE: January 2018 Version 2

1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name	R404A
Chemical Formula	CH3 – CF3 plus CHF2 – CF3 plus CH2F – CF3
Trade Name	R404A
Colour Coding	Disposable cylinder with an Orange body & relevant grade stencilled onto the cylinder
Valve	¼ inch flare fitting
Company Identification	African Oxygen Malawi Limited Johnstone Road, Ginnery Corner Blantyre Tel. No: +265(1)871 611 Fax No: +265(1)871 260
EMERGENCY NO.	**+265 (1) 871 611 (24hrs)**

2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Names	A preparation of R143a, R125, R134a
Chemical Family	Mixtures of Halocarbons
Cas No's.	R143a R125 R134a 420 -46-2, 354-33-6, 811-97-2
UN No.	3337
ERG No	126
Hazchem Warning	2.2 Non-flammable gases

3 HAZARDS IDENTIFICATION

Main Hazards. All cylinders are portable gas containers, and must be regarded as pressure vessels at all times.

Adverse Health effects. Contains a liquefied gas. Contact with liquid may cause frostbite and injury to the cornea.

Chemical hazards. **Heating will cause a rise in pressure with a risk of the cylinders 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

Skin Contact

Ingestion

4 FIRST AID MEASURES

Prompt medical attention is mandatory in all cases of overexposure to vaporised R404A. 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.

Liquid - see vapour inhalation above
Vapour – Irritating vapour.
Liquid - could cause serious burns.
Vapour – irritating vapour

Eye contact. (Liquid)-Rinse with water whilst keeping the eyes wide open for at least 10 minutes. Consult an eye specialist immediately.

Skin contact. (Liquid). Thaw affected areas with water. Remove contaminated clothing and then rinse again with water. If it sticks, do not pull it off. Call a doctor immediately.

Ingestion. 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.

Inhalation. 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 MEASURES

Extinguishing media All extinguishing agents can be used. If there is a fire close by, use suitable extinguishing agents.

Specific hazards. 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 compounds are released).

Emergency Actions Stay upwind. Evacuate the personnel away from the fumes. Cool down the containers/equipment exposed to heat with a water spray.

Protective clothing Self-contained breathing apparatus. Safety gloves and shoes, or boots, should be worn when handling cylinders.

Environmental precautions Prevent the product from spreading into the environment

6 ACCIDENTAL RELEASE MEASURES

Personal precautions. Avoid contact with skin and eyes. Do not breathe gas. For further information refer to 8 "Exposure-controls/Personal Protection" Heavy vapours. Shut off low-level openings in the vicinity (ventilation shafts, drains) Prevent the product from entering cellars, basements of pits. Stop the leak. Ventilate spillage area and basements.

Environmental precautions. Prevent the product from spreading into the environment.

Small spills. Shut off source of product. Ventilate area

Large spills. 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-draught if necessary.

7 HANDLING AND STORAGE

Suck back of water into the container must be prevented. Do not allow back feed into the container. Use only properly specified equipment, which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Refer to supplier's container handling instructions. Keep container below 50^0C in a well-ventilated place. Do not allow cylinders to slide or come into contact with sharp edges. 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.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure hazards As R404A is a simple asphyxiant, avoid 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 exposures to 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 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.
Skin. No known effect.

9 PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Chemical Symbol	Mixture
Molecular Weight	Mixture
Boiling point @ 101,325 kPa	-47.2 to -46.4^{0}C
Density (saturated vapour) @ 20°C	1.06
Vapour pressure @ 20°C	8270 kPa
Colour	colourless
Taste	N/A
Odour	Slightly ethereal

10 STABILITY AND REACTIVITY

Conditions to avoid The dilution of oxygen concentration in the atmosphere to levels which cannot support life. Never use cylinders as rollers or supports, or for any other purpose than the storing of R404A. Never expose the cylinders to excessive heat, as this may cause sufficient build-up of pressure to rupture the cylinders.
Incompatible materials. Since the performance of plastic materials is affected by polymer variations, compounding agents, fillers, and moulding processes, verifying compatibility using actual fabricated parts under end-use conditions. The effects on specific elastomers depend on the nature of the polymer.
Hazardous Decomposition Products Combustion or thermal decomposition will release toxic gases. (Fluorinated compounds).

11 TOXICOLOGICAL INFORMATION

Acute Toxicity (TWA 8+12 hr)

Skin & eye contact	No known effect
Chronic Toxicity	No known effect
Carcinogenicity	No known effect
Mutagen city	No known effect
Reproductive Hazards	No known effect

(For further information see Section 3. Adverse health effects)

12 ECOLOGICAL INFORMATION

Environmental Dangerous to the ozone layer.

13 DISPOSAL CONSIDERATIONS

Disposal Methods 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.

14 TRANSPORT INFORMATION

ROAD TRANSPORTATION

UN No.	3337
ERG No	126
Hazchem warning	2.2 Non-flammable gases

SEA TRANSPORTATION

IMDG	3337
Class	2.2
Label	Non-flammable gas

AIR TRANSPORTATION

ICAO/IATA Code	3337
Class	2.2
Packing instructions	
- Cargo	200
- Passenger	200
Maximum quantities allowed	
- Cargo	150 kg
- Passenger	75 kg

15 REGULATORY INFORMATION

EEC Hazard class: Non-flammable gas

National legislation: OHSact and Regulations 85 of 1993.
Reference: SANS 10234 and its supplement.

16 OTHER INFORMATION

Other Special Considerations: No known data.

EXCLUSION OF LIABILITY

Information contained in this publication is accurate at the date of publication. The company does not accept liability arising from the use of this information, or the use, application, adaptation or process of any products described herein.