MATERIAL SAFETY DATA SHEET (MSDS)
R134A
(Please ensure that this MSDS is received by the appropriate person)

Date: July 2023

1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION

Product Name	R134a
Chemical Formula	CH2-F-CF3
Trade Name	R134a
Colour Coding	Cornflower Blue (F.29) body with a Silver (Plascon 720-022) shoulder and guard. Bulk container Grey.

Company Identification

FRIOFLOR REFRIGERANTS
Suncity, Sector 54
Gurugram, Haryana 122003
INDIA

2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Names:	1,1,1,2 - Tetrafluoroethane
Chemical Family	Halocarbons
Cas No.	811-97-2
UN No.	3159
ERG No	126
Hazchem Warning	2C non-flammable gas

3 HAZARDS IDENTIFICATION

Main Hazards All cylinders are portable gas containers, and must be regarded as pressure vessels at all times. R134a does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in air to below the levels necessary to support life.

Adverse Health effects. The inhalation of high concentrations of R134a vapour may cause temporary central nervous system depression, with narcosis, lethargy and anaesthetic effects. Continued breathing of high concentrations of R134a vapours may produce cardiac irregularities, unconsciousness and death.

Chemical hazards R134a vapours decompose when exposed to high temperatures with the formation of toxic and irritating compounds such as hydrofluoric acid, carbon monoxide and carbonyl fluoride.

Biological hazards Contact with the liquid phase could cause freeze burns.

Vapour inhalation Inhalation of small amounts of R134a vapour does not damage the respiratory organs. (For additional information see "Adverse Health Effects" above).

4 FIRST AID MEASURES

Prompt medical attention is mandatory in all cases of overexposure to vapourised R134a. 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.

Eye contact (Vapour) No known effect.
(Liquid) Immediately flush with large quantities of tepid water, or with sterile saline solution. Seek medical attention.

Skin contact (Vapour) No known effect.
(Liquid) In case of frostbite from contact with liquid R134a, place the frost-bitten part in warm water, about 40-42°C. If warm water is not available, or is impractical to use, wrap the affected part gently in blankets. Encourage the patient to exercise the affected part whilst it is being warmed. Do not remove clothing while frosted.

Ingestion Provided the patient is conscious, wash out the mouth with water, and give 200-300 ml to drink. Obtain immediate medical attention.

5 FIRE FIGHTING MEASURES

Extinguishing media As R134a is non-flammable, it will not contribute to the fire, but could help with the extinguishing by reducing the oxygen content of the air by dilution to below the level to support combustion.

Specific hazards. R134a does not support life. It can act as a simple asphyxiant by diluting the concentration of oxygen in the air below the levels to support life.

Emergency actions If possible, shut off the source of excess R134a. Evacuate area. All cylinders should be removed from the vicinity of the fire. Cylinders that cannot be removed should be cooled with water from a safe distance. Cylinders which have been exposed to excessive heat should be clearly identified and returned to the supplier. CONTACT NEAREST FRIOFLOR BRANCH.

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

Environmental Precautions R134a is heavier than air and could accumulate in low-lying areas. Care should be taken when entering a potentially oxygen-deficient environment. If possible, ventilate the affected area.

6 ACCIDENTAL RELEASE MEASURES

Personal Precautions. Do not enter any areas where R134a has been spilled unless tests have shown that it is safe to do so.

Environmental Precautions R134a does not pose a hazard to the environment.

Small spills Shut off source of the R134a. Ventilate the 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

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.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure hazards As R134a 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 oxygen depleted atmospheres. General methods includes 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	CH2F-CF3
Molecular Weight	102,03
Boiling point @ 101,325 kPa	-26,18^{0}C
Density (saturated vapour) at boiling point	5,26 kg / m³
Auto-ignition temperature	770°C
Ozone depletion potential	0
Halocarbon global warning potential	0,28
Colour	Colourless
Taste	Not applicable
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 R134a. 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, verify compatibility using actual fabricated parts under end-use conditions is advised. The effects on specific elastomers depend on the nature of the polymer, the compounding formulation used and the curing of vulcanizing conditions. Actual samples should be tested under end-use conditions before specifying elastomers for critical components.

Hazardous Decomposition Produce R134a vapours will decompose when exposed to high temperatures from flames or electric resistance heaters. Decomposition may produce toxic and irritating compounds, such as hydrogen fluoride.

11 TOXICOLOGICAL INFORMATION

Acute Toxicity (TWA 8+12 hr)	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

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

12 ECOLOGICAL INFORMATION

As R134a has an Ozone Depletion Potential (ODP) of 0, as well as a very low satiability in water, it does not pose a hazard to the ecology.

13 DISPOSAL CONSIDERATIONS

Disposal Methods Disposal refers to the destruction R134a, and may be necessary when R134a has become badly contaminated with other products, and no longer meets the accepted specification. All badly contaminated products should be sent to qualified waste disposal firms for further treatment

14 TRANSPORT INFORMATION

ROAD TRANSPORATATION

UN No.	3159
ERG No	126
Hazchem warning	2 C Non-flammable gas

SEA TRANSPORTATOION

IMDG	3159
Class	2.2
Label	Non-flammable gas

AIR TRANSPORTATION

ICAO/IATA Code	3159
Class	2.2
Packaging instructions	
- Cargo	200
- Passenger	200
Maximum quantity allowed	
- Cargo	150 kg
- Passenger	75 kg

15 REGULATORY INFORMATION

EEC Hazard class	Non flammable gas
Risk phrases	R20 Harmful by inhalation R34 Liquid phase could cause burns. R44 Risk of explosion if heated under confinement.
Safety phrases	S2 Keep out of reach of children S9 Keep container in a well-ventilated place S15 Keep away from heat S21 When using do not smoke S36 Wear suitable protective clothing S41 In case of fire/explosion do not breathe fumes S51 Use only in well ventilated areas S56 Do not discharge into the environment. Dispose to an authorised waste collection point.

National legislation None

16 OTHER INFORMATION

Bibliography

Showa Denko K.K. Gaseous Products Division. Technical information on R134a. March 1992

IATA Dangerous Goods Regulations 1996

17 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.