REFEX INDUSTRIES LTD.
1/171,Old Mahabalipuram Road,
Thiruporur-603110,Chengalpat District
Phone: +91 44 49971260

Material Safety Data Sheet(MSDS)

Product ID: R407C

==========CHEMICAL PRODUCT/COMPANY IDENTIFICATION=========

Company Identification

Refex Industries Ltd
1/171,Old Mahabalipuram Road,Thiruporur-603110
Chengalpatu District.phone: +91 44 49971260

========COMPOSITION/INFORMATION ON INGREDIENTS========

Components

Material	CAS Number	%
PENTAFLUOROETHANE (HFC-125)	354-33-6	25
1,1,1,2-TETRAFLUORO- ETHANE(HFC-134a)	811-97-2	52
DIFLUOROMETHANE (HFC-32)	75-10-5	23

==========HAZARDS IDENTIFICATION==========

Potential Health Effects: Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse or deliberate inhalation may cause death without warning. Vapor reduces oxygen available for breathing and is heavier than air.
Liquid contact can cause frostbite.

HUMAN HEALTH EFFECTS: Overexposure to the vapors by inhalation may include temporary nervous system depression with anesthetic effects such as dizziness, headache, confusion, incoordination, and loss of consciousness.
Higher exposures to the vapors may cause temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation. Gross overexposure may be fatal.
Skin contact with the liquid may cause frostbite. Individuals with preexisting diseases of the central nervous or cardiovascular system may have increased susceptibility to the toxicity of increased exposures.

Carcinogenicity Information: None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

==========FIRST AID MEASURES==========

First Aid

INHALATION: If inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT: Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.

EYE CONTACT: In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION: Not a probable route. However, in case of accidental ingestion, call a physician.

Notes to Physicians

THIS MATERIAL MAY MAKE THE HEART MORE SUSCEPTIBLE TO ARRHYTHMIAS.
Catecholamines such as adrenaline, and other compounds having similar effects, should be reserved for emergencies and then used only with special caution.

==========FIRE FIGHTING MEASURES==========

Flammable Properties
Flash Point : No flash point
Flammable Limits in Air, % by Volume:
LEL : None per ASTM E681
UEL : None per ASTM E681 Autoignition:
Not determined

Fire and Explosion Hazards: Cylinders may rupture under fire conditions. Decomposition may occur. Contact of welding or soldering torch flame with high concentrations of refrigerant can result in visible changes in the size and color of torch flames. This flame effect will only occur in concentrations of product well above the recommended exposure limit, therefore stop all work and ventilate to disperse refrigerant vapors from the work area before using any open flames. R-407C is not flammable in air at temperatures up to 100deg C (212 deg F) at atmospheric pressure. However, mixtures of R-407C with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. R-407C can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing R-407C and air, or R-407C in an oxygen enriched atmosphere becomes combustible depends on the inter-relationship of 1) the temperature
2) the pressure, and
3) the proportion of oxygen in the mixture. In general,
R-407C should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example: R-407C should NOT be mixed with air under pressure for leak testing or other purposes. Experimental data have also been reported which indicate combustibility of HFC-134a, a component in this blend, in the presence of chlorine.

Extinguishing Media
As appropriate for combustibles in area.

Fire Fighting Instructions : Cool cylinder with water spray or fog. Self-contained breathing apparatus (SCBA) is required if cylinders rupture and contents are released under fire conditions. Water runoff should be contained and neutralized prior to release.

==========ACCIDENTAL RELEASE MEASURES==========

Safeguards (Personnel)
NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Accidental Release Measures

Ventilate area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) for large spills or releases.

==========HANDLING AND STORAGE==========

Handling (Personnel): Avoid breathing vapor. Avoid liquid contact with eyes and skin. Use with sufficient ventilation to keep employee exposure below recommended limits. Contact with chlorine or other strong oxidizing agents should also be avoided. See Fire and Explosion Data section. **Storage:** Clean, dry area. Do not heat above 52 deg C (125 deg F).

==========EXPOSURE CONTROLS/PERSONAL PROTECTION==========

Engineering Controls: Avoid breathing vapors. Avoid contact with skin or eyes. Use with sufficient ventilation to keep employee exposure below the recommended exposure limit. Local exhaust should be used if large amounts are released. Mechanical ventilation should be used in low or enclosed places.

Personal Protective Equipment

Impervious gloves should be used to avoid prolonged or repeated exposure. Chemical splash goggles should be available for use as needed to prevent eye contact. Under normal Manufacturing conditions, no respiratory protection is required when using this product. Self-contained breathing apparatus (SCBA) is required if a large release occurs.

Exposure Guidelines:

Applicable Exposure Limits
PENTAFLUOROETHANE (HFC-125) PEL
(OSHA) : None Established
TLV (ACGIH) : None Established
AEL *: 1000 ppm, 8 & 12 Hr. TWA
WEEL (AIHA) : 1000 ppm, 4900 mg/m3, 8 Hr. TWA
1,1,1,2-TETRAFLUORO- ETHANE, (HFC-134a)
PEL (OSHA) : None Established
TLV (ACGIH) : None Established
AEL *: 1000 ppm, 8 & 12 Hr. TWA
WEEL (AIHA) : 1000 ppm, 8 Hr. TWA
DIFLUOROMETHANE (HFC-32) AEL *: 1000
ppm, 8 & 12 Hr. TWA
WEEL (AIHA) : 1000 ppm, 8 Hr. TWA
* AEL is OUR Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

==========PHYSICAL AND CHEMICAL PROPERTIES==========

Physical Data
Boiling Point : -43.9 C (-47 F) Average
Vapor Pressure : 171.8 psia 25 C (77 F)
% Volatiles : 100 WT%
Evaporation Rate : (Cl4 = 1)
Greater than 1
Solubility in Water : Not determined
Odor : Slight ethereal
Form : Liquefied gas
Color : Clear, colorless
Specific Gravity : 1.136 @ 25 C (77 F)

==========STABILITY AND REACTIVITY==========

Chemical Stability: Material is stable. However, avoid open flames and high temperatures.
Incompatibility with Other Materials: Incompatible with active metals, alkali or alkaline earth metals--powdered Al, Zn, Be, etc.
Decomposition: Decomposition products are hazardous. R407 can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids and possibly carbonyl halides. These materials are toxic and irritating. Contact should be avoided.
Polymerization: Polymerization will not occur.

==========TOXICOLOGICAL INFORMATION==========

Animal Data The blend is untested.

HFC-125
Inhalation 4 hour ALC: > 709,000 ppm in rats
Single, high inhalation exposures caused lethargy, decreased activity, labored breathing and weight loss. Weak cardiac sensitization effect, a potentially fatal disturbance of heart rhythm caused by a heightened sensitivity to the action of epinephrine.
Lowest-Observed-Adverse-Effect-Level for cardiac sensitization: 100,000 ppm.
Repeated exposure caused: No significant toxicological effects.
No-Observed-Adverse-Effect-Level(NOAEL): 50,000 ppm
No animal data are available to define carcinogenic, developmental or reproductive hazards. In animal testing this material has not caused developmental toxicity.
HFC-125 does not produce genetic damage in bacterial or mammalian cell cultures or when tested in animals (not tested for heritable genetic damage).

HFC-134a
Inhalation 4-hour LC50: 567,000 ppm in rats
Single exposure caused: Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine.
Lowest-Observed-Adverse-Effect-Level for cardiac sensitization: 75,000 ppm.

Single exposure caused: Lethargy. Narcosis. Increased respiratory rates. These effects were temporary. Single exposure to near lethal doses caused: Pulmonary edema. Repeated exposure caused: Increased adrenals, liver, spleen weight. Decreased uterine, prostate weight. Repeated dosing of higher concentrations caused: the following temporary effects - Tremors. Incoordination.

CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE,MUTAGENIC EFFECTS:

In a two-year inhalation study, HFC-134a, at a concentration of 50,000ppm, produced an increase in late-occurring benign testicular tumors, testicular hyperplasia and testicular weight. The no-effect-level for this study was 10,000 ppm.

Animal data show slight fetotoxicity but only at exposure levels producing other toxic effects in the adult animal. Reproductive data on male mice show: No change in reproductive performance. Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures, or in animals. In animal testing, this material has not caused permanent genetic damage in reproductive cells of mammals (has not produced heritable genetic damage). **HFC-32**

Inhalation: 4 hour-ALC: > 520,000 ppm in rats

Single exposure caused: Lethargy. Spasms. Loss of mobility in the hind limbs. Other effects include weak cardiac sensitization, a potentially fatal disturbance of heart rhythm caused by a heightened sensitivity to the action of epinephrine. 250,000 ppm.

Repeated exposure caused pathological changes of the lungs, liver, spleen, kidneys. In more recent studies repeated exposure caused: No significant toxicological effects.

No-Observed-Effect-Level (NOEL): 49,100 ppm.

No animal data are available to define the following effects of this material: carcinogenicity, reproductive toxicity. Animal data show slight fetotoxicity but only at exposure levels producing other toxic effects in the adult animal. Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures, or in animals. This material has not been tested for its ability to cause permanent genetic damage in reproductive cells of mammals (not tested for heritable genetic damage).

==========ECOLOGICAL INFORMATION==========

Ecotoxicological Information

HFC-134a

48-hour EC50, Daphnia magna: 980 mg/L

96-hour LC50, Rainbow trout: 450 mg/L

==========DISPOSAL CONSIDERATIONS==========

Waste Disposal: Comply with Federal, State, and local regulations. Reclaim by distillation or remove to a permitted waste disposal facility.

==========TRANSPORTATION INFORMATION==========

Shipping Information DOT/IMO/IATA

Proper Shipping Name : Refrigerant Gas R407C

Hazard Class : 2.2

UN No. : 3340

Label(s) : Nonflammable Gas

Shipping Containers, Tank Cars. Cylinders Ton Tanks

==========OTHER INFORMATION==========

NFPA, NPCA-HMIS
NPCA-HMIS Rating
Health : 1
Flammability : 0
Reactivity : 1

Refex Industries Limited

Issuing Date: 19/01/2023 Revision Date: 19/01/2026

Additional Information
MEDICAL USE: CAUTION: Do not use in medical applications involving permanent implantation in the human body.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.
This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

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