COOLING SUPPLIES

REFRIGERANT HFC-134a

Material Safety Data Sheet

Date Prepared: 27/07/2021

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT INFORMATION:
Name: HFC-134a, R134a
Use: Refrigerant
Formula: CF3-CH2F

DISTRIBUTOR INFORMATION:
ILYS Ltd t/a Cooling Supplies
11A King St
Rangiora
New Zealand
Ph: 0274 746 786
Fax: 03 313 7631
EMERGENCY TELEPHONE NUMBER 0800 746 786 (NZ only)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Components:

Material	**CAS Number**	**%**
ETHANE, 1,1,1,2-TETRAFLUORO	811-97-2	100

3. HAZARDS IDENTIFICATION

Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO HAZARDOUS SUBSTANCES [CLASSIFICATION] REGULATIONS 2001

HSNO classifications

H280 - Liquefied Gas. Contains gas under pressure; may explode if heated.

GHS Label elements

Signal word **WARNING**

Pictograms

Hazard Statements
H280 Contains gas under pressure; may explode if heated.

Prevention statements
P103 Read label before use.

GHS Label elements (cont'd)

Response statements
None allocated.

Storage statements
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Disposal statements
None allocated.

Potential Health Effects

INHALATION
Gross overexposure may cause: Central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Irregular heart beat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death. Suffocation, if air is displaced by vapors.

SKIN CONTACT
Immediate effects of overexposure may include: Frostbite, if liquid or escaping vapor contacts the skin.

EYE CONTACT
"Frostbite-like" effects may occur if the liquid or escaping vapors contact the eyes.

ADDITIONAL HEALTH EFFECTS
Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the central nervous system, cardiovascular system.

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.

4. FIRST AID MEASURES

INHALATION
If high concentrations are 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
In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse. Treat for frostbite if necessary by gently warming affected area.

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

INGESTION
Ingestion is not considered a potential route of exposure.

Notes to Physicians
Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should only be used with special caution in situations of emergency life support.

5. 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
Auto ignition: >743 C(>1369 F)

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.
HFC-134a is not flammable in air at temperatures up to 100 deg. C (212 deg. F) at atmospheric pressure. However, mixtures of HFC-134a with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. HFC-134a can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing HFC-134a and air, or HFC-134a in an oxygen enriched atmosphere become combustible depends on the inter-relationship of:
1) the temperature
2) the pressure, and
3) the proportion of oxygen in the mixture.

In general, HFC-134a should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example HFC-134a 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 in the presence of certain concentrations of chlorine.

Extinguishing Media
Use media appropriate for surrounding material.

Fire Fighting Instructions
Cool tank/container with water spray. Self-contained breathing apparatus (SCBA) may be required if cylinders rupture or release under fire conditions. Water runoff should be contained and neutralized prior to release.

6. 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. Ventilate area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) if large spill or leak occurs.

7. HANDLING AND STORAGE

Handling (Personnel)
Use with sufficient ventilation to keep employee exposure below recommended limits.

Handling (Physical Aspects)
HFC-134a should not be mixed with air for leak testing or used for any other purpose above atmospheric pressure. See Flammable Properties section. Contact with chlorine or other strong oxidizing agents should also be avoided.

Storage
Store in a clean dry place. Do not heat above 52 C (126 F). Valve protection caps and valve cutlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do NOT drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Never attempt to lift cylinder by its cap. Use a pressure reducing regulator when connecting cylinder to lower pressure (>3000 psig) piping or systems. Do NOT heat cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Storage area temperatures should not exceed 125 deg F (52 deg C) and should be free of combustible materials. Avoid area where salt or other corrosive materials are present. Avoid excessive inventory and storage time. Use a first-in first-out system. Keep accurate inventory records.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls
Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places. Refrigerant concentration monitors may be necessary to determine vapor concentrations in work areas prior to use of torches or other open flames, or if employees are entering enclosed areas.

Personal Protective Equipment
Impervious gloves and chemical splash goggles should be used when handling liquid. 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 Limits

PEL (OSHA) : None Established
TLV (ACGIH) : None Established
AEL : 1000 ppm, 8 & 12 Hr. TWA
WEEL (AIHA) : 1000 ppm, 8 Hr. TWA

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point: -26.5 C (-15.7 F) @ 736 mm Hg
Vapor Pressure: 96 psia @ 25 C (77 F)
Vapor Density: 3.6 (Air=1.0) @ 25 C (77 F)
% Volatiles: 100 WT%
Solubility in Water: 0.15 WT% @ 25 C (77 F) @ 14.7 psia
Odour: Ether (slight).
Form: Liquefied Gas.
Colour: Colourless.
Liquid Density: 1.21 g/cm3 @ 25 C (77 F)
Specific Gravity: 1.208 @ 77 F (25 C)
Evaporation Rate: (CCL4 = 1); greater than 1

10. STABILITY AND REACTIVITY

Chemical Stability
Stable.

Conditions to Avoid
Avoid open flames and high temperatures.

Incompatibility with Other Materials
Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

Decomposition
Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid and possibly carbonyl fluoride.
These materials are toxic and irritating. Contact should be avoided.

Polymerization
Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Animal Data
ETHANE, 1,1,1,2-TETRAFLUORO-

EYE:
A short duration spray of vapor produced very slight eye irritation.

SKIN:
Animal testing indicates this material is a slight skin irritant, but not a skin sensitizer.

INHALATION:

4 hour, ALC, rat: 567,000 ppm.
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 50,000 ppm, 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).

12. ECOLOGICAL INFORMATION

ECO-TOXILOGICAL INFORMATION

Aquatic Toxicity:

LC50 (96 hours) Fish 450mg/L
EC50 (48 hours) Crustacea 980mg/L
EC50 (72 hours) Algae or other aquatic plants >114mg/L
NOEC (72 hours) Algae or other aquatic plants ca.13.2mg/L

Persistence and degradability:

Persistence: Water/Soil HIGH
Persistence: Air HIGH

Bio-accumulative potential:
LOW (LogKOW = 1.68)

Mobility in soil:
LOW (KOC = 96.63)

13. DISPOSAL CONSIDERATIONS

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

14. TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO
Proper Shipping Name: 1,1,1,2-TETRAFLUOROETHANE
Hazard Class: 2.2
HAZCHEM code: 2TE
UN No: 3159
Marine Pollutant: No
DOT/IMO Label: NONFLAMMABLE GAS

Shipping Containers
Tank Cars, Tank Trucks, Ton Tanks, Cylinders.

15. REGULATORY INFORMATION

Approval code: HSR002533
Group standard: Compressed Gases (Non-hazardous) Group Standard 2006
Inventory listing(s): NEW ZEALAND: NZIoC (New Zealand Inventory of Chemicals)
All components are listed on the NZIoC inventory, or are exempt.

U.S. Federal Regulations

TSCA Inventory Status: Listed.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute: Yes
Chronic: Yes
Fire: No
Reactivity: No
Pressure: Yes

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance: No
CERCLA Hazardous Substance: No
SARA Toxic Chemical: No

16. OTHER INFORMATION

NFPA, NPCA-HMIS
NPCA-HMIS Rating

Health: 1
Flammability: 0
Reactivity: 1

Personal Protection rating to be supplied by user depending on use conditions.

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.

End of MSDS