1. CHEMICAL PRODUCT

Material Identification

Product Name	: R134a
CAS Number	: 811-97-2
Formula	: CH2FCF3
CAS Name	: 1,1,1,2-TETRAFLUOROETHANE

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Gas under pressure, Liquefied Gas
SIGNAL WORD: WARNING
HAZARD STATEMENT(S): Contains gas under pressure, may explode if heated
SYMBOL(S): Gas Cylinder

PRECAUTIONARY STATEMENT(S):
Storage: Protect from sunlight, store in a well-ventilated place.

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 ervous 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.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components Material	CAS Number	%
ETHANE, 1,1,1,2-TETRAFLUORO-(HFC-134a)	811-97-2	100

4. FIRST AID MEASURES

First Aid
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
LEL	: None per ASTM E681
UEL	: None per ASTM E681
Autoignition	: >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).

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 Guidelines	Exposure Limits
PEL (OSHA)	: None Established
TLV (ACGIH)	: None Established
AEL* (DuPont)	: 1000 ppm, 8 & 12
TWA WEEL	Hr. : 1000 ppm, 8

* AEL is KHCK's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point	: -26.5 C (-15.7 F) @ 736
Vapor Pressure	: 96 psia @ 25 C (77 F)
Vapor Density	: 3.6 (Air=1.0) @ 25 C (77 F)
% Volatiles	: 100 WT%
Solubility in	: 0.15 WT% @ 25 C (77 F) @ 14.7 psia
Odor	
Form	: Liquified Gas.
Color	: Colorless.
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
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

Ecotoxicological Information AQUATIC TOXICITY:
48 hour EC50 - Daphnia magna: 980 mg/L. 96 hour LC50 - Rainbow trout: 450 mg/L

13. DISPOSAL CONSIDERATIONS

Waste Disposal
Contaminated HFC-134a can be recovered by distillation or removed to a permitted waste disposal facility. Comply with Federal, State, and local regulations.

14. TRANSPORTATION INFORMATION

Shipping Information DOT/IMO

Proper Shipping Name UN No.	: 1,1,1,2-TETRAFLUOROETHANE Hazard Class : 3159
DOT/IMO Label	: NONFLAMMABLE GAS
Shipping Containers	: Tank Cars, Tank Trucks, Ton Tanks, Cylinders.

15. REGULATORY INFORMATION

U.S. Federal Regulations
TSCA Inventory Status : Reported/Included.
TITLE III HAZARD CLASSIFICATIONS SECTIONS 311,
Acute : Yes
Chronic : Yes
Fire : No
Reactivity : No
Pressure : Yes
HAZARDOUS CHEMICAL LISTS
SARA Extremely Hazardous Substance :
CERCLA Hazardous Substance No
SARA Toxic Chemical :

16. OTHER INFORMATION

OTHER INFORMATION:
HMIS Classification: Health – 1, Flammability – 1, Reactivity - 0
NFPA Classification: Health – 1, Flammability – 1, Reactivity – 0
ANSI/ASHR AE 34 Safety Group – A1
UL Classified

Regulatory Standards:
1. OSHA regulations for compressed gases" 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101

Toxicity information per PAFT Testing

DISCLAIMER

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