MATERIAL SAFETY DATA SHEET

1. Chemical Product and Company Identification 274

KLEA ® 134a

General Use: Refrigerant

Alternate names: Fluorocarbon 134a, R134a, HFC134a, HFA134a

ICI Americas Inc.
P. O. Box 15391
Concord Plaza, 3411 Silverside Road
Wilmington, DE 19850

Issue Date: 10/07/96
Rev.: H
BPCS: 274

ICI Operator (24 hr.): 302-887-3000
Medical Emergency (24 hr.): 1-800-228-5635 Extension 181
Only in the event of a transportation emergency involving a chemical spill, leak, fire, etc., call CHEMTREC 1-800-424-9300.

2. Composition Information on Ingredients

Ingredients:	%(wt)	OSHA PEL
1,1,1,2-Tetrafluoroethane (CAS 811-97-2)	100	Not listed

3. Hazards Identification

Emergency Overview:

<u>Appearance:</u> Colorless liquified gas with faint ethereal odor
<u>Physical hazards</u>*: Compressed liquified gas
<u>Health hazards</u>*: Harmful (central nervous system depression, cardiac arrhythmias)

*Hazard summary (as defined by OSHA Hazard Comm. Std., 29 CFR 1910.1200):

Potential Health Effects:

<u>General</u>: The health hazard assessment is based on toxicity studies together with information from a search of the scientific literature and other commercial sources.

<u>Ingestion</u>: Extremely unlikely to occur in use.

<u>Eye contact</u>: Liquid splashes or vapor spray may cause freeze burns.

<u>Skin contact</u>: The liquid form of this product may cause freeze burns (frostbite-like lesions).

<u>Skin absorption</u>: This product will probably not be absorbed through human skin.

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Hazards identification (continued):

Inhalation: Exposure to very high vapor concentrations can induce anesthetic effects progressing from dizziness, weakness, nausea, to unconsciousness. It can act as an asphyxiant by limiting available oxygen. At very high doses, cardiac sensitization to circulating epinephrine-like compounds can result in fatal cardiac arrhythmias.

Other effects of overexposure: None expected.

4. First Aid Measures

Skin: Thaw affected area with water. Remove contaminated clothing. Caution: clothing may adhere to the skin in case of freeze burns. After contact with skin, wash immediately with plenty of warm water. If symptoms (irritation or blistering) develop, get medical attention.

Eyes: Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Have eyes examined and treated by medical personnel.

Ingestion: Not applicable.

Inhalation: Remove victim to fresh air. Keep warm and at rest. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is labored, give oxygen. In the event of a cardiac arrest, apply external cardiac massage. Do not administer adrenaline or similar sympathomimetic drugs as cardiac arrhythmias may result. Get immediate medical attention.

5. Fire Fighting Measures

Flashpoint and method: Does not flash

Autoignition temperature: Not applicable

Flammable limits (STP): Nonflammable

General hazards: Compressed liquefied gas. HFC 134a is not flammable in air under ambient conditions of temperature and pressure. In laboratory tests, under conditions of high pressure, HFC 134a/air mixtures were shown to be flammable. In general, for the test equipment used, at temperatures up to 170 deg. C., flammable mixtures were only produced at pressures greater than 50 psia, and with more than 60 volume % air. Mixtures of HFC 134a should not be used for pressure or leak testing. Thermal decomposition will evolve toxic and irritant vapors.

Firefighting instructions: Not applicable. Use media suitable for surrounding fire. Use water spray to cool containers.

Firefighting equipment: Self-contained breathing apparatus with full facepiece and protective clothing.

Hazardous combustion products: Heavy vapors can suffocate. Highly toxic decomposition products.

6. Accidental Release Measures

Shut off leak if without risk. Ventilate the spill area. If possible dike and contain spillage. Prevent liquid from entering sewers, sumps or pit areas since vapor can create suffocating atmosphere. Use self-contained breathing apparatus to avoid suffocation. Allow spilled liquid to evaporate. Protect against frost-bite from evaporating liquid.

7. Handling and Storage

Storage temperature: Keep at temperature not exceeding 113 deg. F. (45 deg. C.).

General: Keep in a cool place. Keep containers dry. Keep away from direct sunlight, heat and sources of ignition.

8. Exposure Controls/Personal Protection

Exposure guidelines: No ACGIH TLV or OSHA PEL assigned. Minimize exposure in accordance with good hygiene practice. ICI has established an employee exposure standard of 1,000 ppm (Air TWA) for this material.

Engineering controls: Ventilate low-lying areas such as sumps or pits where dense vapors collect. Use ventilation adequate to maintain safe levels. Provide eyewash station in work area.

Respiratory protection: Not normally needed if controls are adequate. If needed, use MSHA-NIOSH approved respirator for organic vapors. For high concentrations and oxygen-deficient atmospheres, use positive pressure air-supplied respirator.

Protective clothing: Impervious gloves if any possibility of skin contact with liquid. Additional protection may be required such as apron, arm covers, or full body suit, depending upon conditions.

Eye protection: Chemical light goggles; full faceshield in addition if splashing is possible.

9. Physical and Chemical Properties

Appearance: Colorless liquified gas
Boiling point: -15.1 deg. F., -26.2 deg C.
Vapor pressure (mmHg at 20 deg. C.): 4268
Vapor density (air = 1): 3.3
Solubility in water: Very low
pH: Not applicable
Specific gravity: 1.27 at 20 deg. C.
% Volatile by volume: 100

10. Stability and Reactivity

Stability: Stable under normal conditions.

Incompatibility: Finely divided metals, magnesium and alloys containing more than 2% magnesium. Can react violently if in contact with alkali or alkali earth metals such as sodium, potassium or barium.

continued

Stability and Reactivity (continued)

Hazardous decomposition products: Halogen acids by thermal decomposition and hydrolysis.

Hazardous polymerization: Will not occur.

11. Toxicological Information

Possible Human Health Effects:

Inhalation: High atmospheric concentrations may lead to anesthetic effects, including loss of consciousness. Very high exposures may cause an abnormal heart rhythm and prove suddenly fatal. Higher concentrations may cause asphyxiation due to reduced oxygen content of the atmosphere.

Skin contact: Liquid splashes or spray may cause freeze burns. Unlikely to be hazardous by skin absorption.

Eye contact: Liquid splashes or spray may cause freeze burns.

Ingestion: Highly unlikely, but should this occur, freeze burns will result.

Animal data:

The inhalation 4 hour LC50 in rats was greater than 500,000 ppm HFC 134a.

Because of its volatility, this compound has not been tested for skin or eye irritancy, or skin sensitization.

The threshold for cardiac sensitization (arrhythmias) in dogs pretreated with epinephrine was an atmosphere of 75,000 ppm.

No effect of any kind was seen in a 90 day inhalation study in the rat at dose levels up to, and including 50,000 ppm (6 hours per day, 5 days per week).

No developmental effects were seen in the rabbit following inhalation exposure to 40,000 ppm during gestation despite slight maternal toxicity. In a range-finding study in the rabbit, possible minimal embryolethality was seen at a dose level of 50,000 ppm. In the rat, slight fetotoxicity was present at an inhalation dose of 50,000 ppm administered during gestation and no effects were seen at 10,000 ppm. In another study in the rat, no developmental effects were seen at a dose of 100,000 ppm in the presence of slight maternal toxicity; clear maternal effects were followed by embryotoxicity and fetotoxicity at a dose level of 300,000 ppm. There were no increases in the incidence of fetal malformations in rats or rabbits at doses up to and including 300,000 ppm and 50,000 ppm, respectively.

HFC 134a showed no genetic toxicity in a range of in-vitro and in-vivo tests. No adverse effects were found in a study in which rats were followed to week 104 after receiving 300 mg/kg bodyweight/day of HFC 134a by gavage for 52 weeks. In a 2-year inhalation study in rats, no adverse effects of any kind were observed except increased incidences of non life threatening, benign, microscopic testicular interstitial (Leydig) cell tumors and associated interstitial cell hyperplasia which were confined to the top dose of 50,000 ppm.

12. Ecological Information

Persistence and degradation: Decomposes comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 16.6 years. Products of decomposition will be highly dispersed and hence will have a very low concentration. Does not influence photochemical smog (e.g. is not a VOC under the UNEC convention). Has no effect on the ozone layer.

Effect on effluent treatment: Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

13. Disposal Considerations

Disposal method: Discarded product is not a hazardous waste under RCRA, 40 CFR 261.

Container disposal: For disposable (DOT 39) cylinders only. Do not distribute, make available, furnish or reuse empty container when once emptied of the original product. Open valve to remove pressure in the cylinder. Then puncture, drill, crush or otherwise destroy empty cylinder and dispose of in a facility permitted for nonhazardous waste.

14. Transport Information

DOT Hazard Description:

Proper Shipping Name: 1,1,1,2-TETRAFLUOROETHANE (R134A)
Hazard Class: 2.2
Identification Number: UN 3159
Packaging Group: None
Hazardous Substance (RQ): None
Placard/Label: NON-FLAMMABLE GAS

Code 49CFR of the Federal Regulations
JJ Keller Wisconsin

15. Regulatory Information

TSCA (Toxic Substances Control Act) Regulations, 40 CFR 710: All ingredients are on the TSCA Chemical Substances Inventory.

CERCLA and SARA Regulations (40 CFR 355, 370 and 372): This product does not contain any chemicals subject to reporting requirements of SARA Section 313.

16. Other Information

The information herein is given in good faith, but no warranty, expressed or implied, is made.