

R- 134a Material Safety Data Sheet

1 PRODUCT AND COMPANY IDENTIFICATION

Product Name	Forane(R) 134a
Product Synonym(s)	A list of applicable products can be found in Section 16
Chemical Family	Hydrofluorocarbon
Chemical Formula	CF ₃ CH ₂ F
Chemical Name	1,1,1,2-tetrafluoroethane (HFC - 134a)
EPA Reg Num	
Product Use	Refrigerant

Company Identification

LOKOT CHEMICAL COMPANY INC.

Add: 13423 COUNTRY PATH WAY HOUSTON USA

Tel: +01 8325667688

Fax : +01 8324150241

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical Wt. %	OSHA
1,1,1,2-Tetrafluoroethane (HFC-134a)	811-97-2	100%	Y

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview

Clear, colorless liquified gas with faint ethereal (ether like) odor.

WARNING!

LIQUID AND GAS UNDER PRESSURE, OVERHEATING AND OVERPRESSURIZING MAY CAUSE GAS RELEASE OR VIOLENT CYLINDER BURSTING. MAY DECOMPOSE ON CONTACT WITH FLAMES OR EXTREMELY HOT METAL SURFACES TO PRODUCE TOXIC AND CORROSIVE PRODUCTS. VAPOR REDUCES OXYGEN AVAILABLE FOR BREATHING AND IS HEAVIER THAN AIR. HARMFUL IF INHALED AND MAY CAUSE HEART IRREGULARITIES, UNCONSCIOUSNESS OR DEATH. LIQUID CONTACT WITH EYES OR SKIN MAY CAUSE FROSTBITE.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. As with most liquified gases, contact with the rapidly volatilizing liquid or cold vapor can cause frostbite to any tissue. High vapor concentrations are irritating to the eyes and respiratory tract and may result in central nervous system (CNS) effects such as headache, dizziness, anesthesia, drowsiness and, in severe exposure, loss of consciousness and death. The dense vapor of this material may reduce the available oxygen for breathing and produce symptoms such as headache, dizziness, drowsiness, cyanosis and lack of muscle control followed by collapse. Prolonged

exposure to an oxygen-deficient atmosphere may be fatal. Inhalation of this material may cause an increase in the sensitivity of the heart to adrenaline, which could result in irregular or rapid heartbeats and reduced heart function. Workers with heart disease or compromised heart function should limit exposure to this material.

4 FIRST AID MEASURES

IF IN EYES, immediately flush with plenty of water. Get medical attention if irritation persists.

IF ON SKIN, Flush exposed skin with lukewarm water (not hot), or use other means to warm skin slowly. Get medical attention if frostbitten by liquid or if irritation occurs.

IF SWALLOWED, Not applicable - product is a gas at ambient temperatures.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention. Do not give adrenaline, epinephrin or similar drugs following exposure to this product.

5 FIRE FIGHTING MEASURES

Fire and Explosive Properties

Auto-Ignition Temperature	743 C (1 bar)	
Flash Point	NA - GAS	Flash Point Method
Flammable Limits- Upper	NA	
Lower	NA	

Extinguishing Media

Use extinguishing media appropriate to surrounding fire conditions.

Fire Fighting Instructions

Stop the flow of gas if possible. Use water spray on person making shut-off. Fire fighters and others who maybe exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipments should be thoroughly decontaminated after use.

Fire and Explosion Hazards

May decompose on contact with flames or extremely hot metal surfaces to produce toxic and corrosive products. Liquid and gas under pressure, overheating or overpressurizing may cause gas release and/or violent cylinder bursting. Container may explode if heated due to resulting pressure rise. Some mixtures of HCFCs and/or HFCs, and air or oxygen may be combustible if pressurized and exposed to extreme heat or flame.

6 ACCIDENTAL RELEASE MEASURES

In Case of Spill or Leak

Use Halogen leak detector or other suitable means to locate leaks or check atmosphere. Keep upwind. Evacuate enclosed spaces and disperse gas with floor-level forced-air ventilation. Exhaust vapors outdoors. Do not smoke or operate internal combustion engines. Remove flames and heating elements.

7 HANDLING AND STORAGE

Handling

Avoid breathing gas. Avoid contact with eyes, skin and clothing. Keep container closed. Use only

pH	NA
Specific Gravity	1.21 @ 4 C
Vapor Pressure	0.665 MPa (6.66 bar) (25 C)
Vapor	Density 3.25
Melting Point	NE
Freezing Point	-101 C (-149.8 F)
Boiling Point	-26.4 C/ -15.5 F
Solubility In Water	(25 C): 0.9 g/lMolecular Weight 102.03
Bulk Density	1.21 @ 25 C (g/cm3)
n-Octanol/Water Partition Coefficient	log Pow: 1.06
Other Physical Data	Decomposition temperature: >370 C (700 F) Critical temperature: 101 C Critical pressure: 4.07 MPa (40.7 bar)

10 STABILITY AND REACTIVITY

Stability

This material is chemically stable under specified conditions or storage, shipment and/or use. See HANDLING AND STORAGE section of this MSDS for specified conditions.

Incompatibility

Avoid contact with strong alkalis or alkaline earth metals, finely powdered metals such as aluminum, magnesium or zinc and strong oxidizers, since they may react or accelerate decomposition.

Hazardous Decomposition Products

Thermal decomposition products include hydrogen fluoride, hydrogen chloride, carbon monoxide, carbon dioxide and chlorine.

11 TOXICOLOGICAL INFORMATION

Toxicological Information

1,1,1,2-Tetrafluoroethane (HFC-134a)

No skin allergy was observed in guinea pigs following repeated exposure. Acute inhalation exposure produced anesthetic effects in mice, dogs, cats and monkeys. Repeated inhalation exposure produced no adverse effects in rats. Inhalation of this material, followed by intravenous injection of epinephrine to simulate stress reactions, resulted in cardiac sensitization in dogs. Following long-term inhalation studies in rats, an increased incidence of benign tumors (at high concentrations) in the testes were the only tumors observed. No birth defects were noted in the offspring of rats exposed to this material by inhalation during pregnancy, even at dosages which produced significant adverse effects in the mother. This material produced no genetic changes in standard tests using bacterial or animal cells and whole animals. Single exposure (acute) studies indicate: Inhalation - Practically Non-toxic to Rats (4-hr LC50 >500,000 ppm; 30-min LC50 ~750,000 ppm)

Eye Irritation - Slightly Irritating to Rabbits
Skin Irritation - Slightly Irritating to Rabbits (24-hr exposure)

12 ECOLOGICAL INFORMATION

Ecotoxicological Information

Based on its low n-octanol/water partition coefficient (log Pow of 1.06), bioaccumulation of this material is considered unlikely.

Chemical Fate Information

Based on its low n-octanol/water partition coefficient (log Pow 1.06), bioaccumulation of this material is considered unlikely. When evaluated in a 28 day activated sludge test, 3% degradation of this material was observed.

13 DISPOSAL CONSIDERATIONS

Waste Disposal

Recover, reclaim or recycle when practical. Dispose of in accordance with federal, state and local regulations. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

IMO Name 1,1,1,2-tetrafluoroethane

IMO Technical Name

IMO	Hazard	Class
		2.2

UN Number UN 3159

IMO Packing Group PG NA

RQ



15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	N
Delayed (Chronic) Health	N	Reactive	N
		Sudden Release of Pressure	Y

The components of this product are all on the TSCA inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	<u>CERCLA RQ</u>	<u>SARA TPQ</u>
1,1,1,2-Tetrafluoroethane (HFC-134a)	NE	

16 OTHER INFORMATION

Revision Information

Revision Date

Supersedes Revision Dated

Revised section 9.

Revision Summary

20 SEP 2001

13-JUL-2000

Revision Number 6

Key

NE= Not Established

NA= Not Applicable

(R) = Registered Trademark

Miscellaneous

This MSDS applies to the following grades:

Forane 134a - Appliance Grade

Forane 134a

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