

**1 PRODUCT AND COMPANY IDENTIFICATION**

Fluorochemicals
2000 Market Street

Philadelphia, PA 19103

Information Telephone Numbers

Product Information

Product Name Forane (R) 134a
Product Synonym(s) A list of applicable products can be found in Section 16

Chemical Family Hydrofluorocarbon
Chemical Formula CF₃CH₂F
Chemical Name 1,1,1,2-tetrafluoroethane (HFC - 134a)
EPA Reg Num
Product Use Refrigerant

EMERGENCY PHONE NUMBERS:

Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(303) 623-5716 (24Hrs)

Phone Number

800-245-5858

Available Hrs

8:00 am - 5:30 pm (Eastern)

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**

Colorless liquified gas with faint ether 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	NA	
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 may be 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 equipment 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 HCFs, 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

7 HANDLING AND STORAGE

Handling

Avoid breathing gas. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Do not enter confined spaces unless adequately ventilated.

Storage

Do not apply direct flame to cylinder. Do not store cylinder in direct sun or expose it to heat above 120 F. Do not drop or refill this cylinder. Keep away from heat, sparks and flames.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see below). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Eye / Face Protection

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection

Avoid breathing gas. Use NIOSH approved respiratory protection equipment appropriate to the material and/or its components (full facepiece recommended) when airborne exposure limits are exceeded (see below). Consult respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit	Value
1,1,1,2-Tetrafluoroethane (HFC-134a)	
WEEL TWA	-
	1000 ppm 4240 mg/m3

-Only those components with exposure limits are printed in this section.

-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Colorless liquified gas with faint ether odor.
pH	NA
Specific Gravity	1.21 @ 25 C/ 77 F
Vapor Pressure	96.16 PSIA @ 77 F
Vapor Density	3.25
Melting Point	NE
Freezing Point	-101 C/ -149 F
Boiling Point	-26.4 C/ -15.5 F
Solubility In Water	Slight
Percent Volatile	100
Molecular Weight	86.48

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 alkali 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 allergic skin response was observed in guinea pigs following repeated skin exposure to this material. Inhalation of very high concentrations of this material (generally exceeding 50000 ppm) produces a rapid anesthetic effect in mice, dogs, cats and monkeys. As with many other halogenated hydrocarbons, inhalation of this material, followed by intravenous injection of epinephrine to simulate human stress reactions, resulted in heart sensitization at levels above about 75000 ppm in dogs. No toxic effects were observed in rats exposed 6 hours/day, 5 days/week for 13-weeks to this material concentrations up to 50000 ppm. No toxic effects and no tumors were observed in an oral dose study of rats given corn oil solutions of this material at 300 mg/kg/day for 1-year followed by lifetime observation. Long-term inhalation (2-years) of high concentrations of this material (50000 ppm) caused an increased incidence of benign, not life-threatening tumors of the testes in rats. No exposure-related effects or tumors were observed at 10000 ppm in this study. This material was negative in the mouse dominant lethal assay. No birth defects were noted in rats and rabbits exposed to this material by inhalation during pregnancy, even at levels (300000 ppm and 50000 ppm, respectively) which produced toxic effects in the mothers and their offspring. This material produced no genetic changes in standard tests using animals (in vivo tests) and animal or bacterial cells. Metabolism studies in rats exposed by the oral and inhalation routes show that this material is not metabolized or accumulated in the body to any significant extent

11 TOXICOLOGICAL INFORMATION

and is rapidly eliminated in the exhaled air. 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

DOT Name	1,1,1,2-tetrafluoroethane
DOT Technical Name	
DOT Hazard Class	2.2
UN Number	UN 3159
DOT 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	CERCLA RQ	SARA TPQ
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Forane (R) 134a
-Material Safety Data Sheet-
Elf Atochem North America, Inc.

SARA Reportable Quantities

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

CERCLA RQ

SARA TPQ

NE

16 OTHER INFORMATION

Revision Information

Revision Date	17 JUL 1999	Revision Number	1
Supersedes Revision Dated	New Document		

Revision Summary

Initial Entry

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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