



## 1 PRODUCT AND COMPANY IDENTIFICATION

### Fluorochemicals Group Retired MSDS

### EMERGENCY PHONE NUMBERS:

Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887  
Medical: Rocky Mountain Poison Control Center  
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Product Name	Forane (R) 114	
Product Synonym(s)		
Chemical Family	Chlorofluorocarbon	
Chemical Formula	CCIF <sub>2</sub> CCIF <sub>2</sub>	
Chemical Name	Dichlorotetrafluoroethane (R-114)	
EPA Reg Num		
Product Use	Medical Inhaler Propellant	

## 2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical %	OSHA
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-	76-14-2	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 Hazard 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 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, drowsiness and, in severe exposure, loss of consciousness and death. The dense vapor of this material may reduce the available oxygen for breathing. Prolonged exposure to an oxygen-deficient atmosphere may be fatal. Inhalation may cause an increase in the sensitivity of the heart to adrenaline, which could result in irregular or rapid heartbeats. Medical conditions aggravated by exposure to this material include heart disease or compromised heart function.

#### 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 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 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. When airborne exposure limits are exceeded (see below), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components (full facepiece recommended). 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
<b>Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-</b>	
ACGIH TWA	6990 mg/m3 1000 ppm
OSHA TWA PEL	7000 mg/m3 1000 ppm

- 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.
- ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.
- WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

**9 PHYSICAL AND CHEMICAL PROPERTIES**

Appearance/Odor	Colorless liquified gas with faint ether odor.
pH	NE
Specific Gravity	1.44 @ 30/0 C
Vapor Pressure	27.26 PSIA @ 21 C/70 F
Vapor Density	5.9
Melting Point	NE
Freezing Point	-94 C (-137 F)
Boiling Point	3.8 C (38.8 F)
Solubility In Water	Slight
Percent Volatile	100
Molecular Weight	170.9

## 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

Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-

Studies with human volunteers indicate that use of household aerosol products containing this material caused no adverse health effects. Following acute inhalation exposure, anesthesia, heart arrhythmia, reduced heart function, effects on blood pressure, bronchoconstriction, and other effects on the heart and respiratory system were observed in dogs, rats, mice and monkeys. Repeated inhalation exposure increased white blood cell counts and caused respiratory tract effects in rats and mice. Uncoordinated, tremors and occasionally convulsions were observed in dogs following inhalation exposure. No adverse effects were observed in dogs following repeated inhalation exposure. Cardiac sensitization has been demonstrated in dogs exposed to chlorofluorocarbons including this material. Studies have shown that mixtures of chlorofluorocarbons may produce greater heart effects than caused by the individual compounds. Repeated oral dosing produced no adverse effects in rats. Skin irritation was the only effect observed in rats and rabbits following repeated skin applications. No birth defects were noted in the offspring of rats or rabbits exposed by inhalation to a mixture containing this material during pregnancy. No genetic changes were observed in tests using bacteria.

Single exposure (acute) studies indicate:

Oral - No More than Slightly Toxic to Rats (LD50 >2,250 mg/kg)

Inhalation - Practically Non-toxic to Rats (4-hr LC50 600,000 ppm)

Eye Irritation - Irritating to Rabbits

Skin Irritation - Irritating to Rats

## 12 ECOLOGICAL INFORMATION

### Ecotoxicological Information

Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-

This material is practically non-toxic to Atlantic oyster embryos (48-hr LC50 >100 mg/l). The 192-hr LC50 for grass shrimp was 10% of saturation at 18C and the 96-hr LC50 for killifish was 34.9% of saturation at 18C.

### Chemical Fate Information

No data are available.



**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 1,2 - Dichloro - 1,1,2,2 - tetrafluoroethane  
DOT Technical Name  
DOT Hazard Class 2.2  
UN Number UN 1958  
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
Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-	NE	NE

**SARA Title III, Section 313**

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-

**Massachusetts Right to Know**

This product does contain the following chemical(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-

**New Jersey Right to Know**

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-

**Pennsylvania Right to Know**

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Ethane, 1,2-dichloro-1,1,2,2-tetrafluoro-

**16 OTHER INFORMATION**



**Revision Information**

Revision Date 19 OCT 2006 Revision Number 5  
Supercedes Revision Dated 11-OCT-2004

**Revision Summary**

Retired

**Key**

NE= Not Established NA= Not Applicable (R) = Registered Trademark

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