



# Material Safety Data Sheet

## IDENTIFICATION

### **R-134A REFRIGERANT**

1,1,1,2-Tetrafluoroethane

### **TRADENAMES AND SYNONYMS**

Dymel® 134a, Genetron® 134a, HFA-134a, HFC-134a, R-134a, Suva® 134a, Freon® 134A Norflurane®

### **MANUFACTURER/ DISTRIBUTOR**

Compressed Cylinder Services, Inc.  
8025 Arjons Drive  
San Diego, CA 92126

Product Information: 1-800-610-4571

Emergency: PERS 1-800-633-8253 (International 1-801-629-0667)

### **DISTRIBUTION DATE**

01/01/2013

## HAZARD(S) IDENTIFICATION

### **POTENTIAL HEALTH EFFECTS**

#### **INHALATION**

ETHANE, 1,1,1,2-TETRAFLUORO-

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**

ETHANE, 1,1,1,2-TETRAFLUORO-

Immediate effects of overexposure may include: Frostbite, if liquid or escaping vapor contacts the skin.

#### **EYE CONTACT**

ETHANE, 1,1,1,2-TETRAFLUORO-

"Frostbite-like" effects may occur if the liquid or escaping vapors contact the eyes.

#### **ADDITIONAL HEALTH EFFECTS**

ETHANE, 1,1,1,2-TETRAFLUORO-

Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the: central nervous 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.

## COMPOSITION/INFORMATION ON INGREDIENTS

### **COMPONENTS**

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



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## **FIRST-AID MEASURES**

### **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.

## **FIRE FIGHTING MEASURES**

### **FLAMMABLE PROPERTIES**

Flash Point: No flash point

Flammable Limits in Air, % by Volume:

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.



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## **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.

## **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.

## **HANDLING AND STORAGE**

### **HANDLING (PERSONNEL)**

Use with sufficient ventilation to keep employee exposure below recommended limits.

### **HANDLING (PHYSICAL)**

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). Valve protection caps and valve cutlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do NOT drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Never attempt to lift cylinder by its cap. Use a pressure reducing regulator when connecting cylinder to lower pressure (>3000 psig) piping or systems. Do NOT heat cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Storage area temperatures should not exceed 125 deg F (52 deg C) and should be free of combustible materials. Avoid area where salt or other corrosive materials are present. Avoid excessive inventory= and storage time. Use a first-in first-out system. Keep accurate inventory records.

## **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 LIMITS**

FREON® 13 Refrigerant

PEL (OSHA):	None Established
TLV (ACGIH):	None Established
WEEL (AIHA):	1000 ppm, 8 Hr. TWA



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## PHYSICAL AND CHEMICAL PROPERTIES

### PHYSICAL DATA

Boiling Point: -26.5 C (-15.7 F) @ 736 mm Hg  
Vapor Pressure: 96 psia @ 25 C (77 F)  
Vapor Density: 3.6 (Air=1.0) @ 25 C (77 F)  
% Volatiles: 100 WT%  
Solubility in Water: 0.15 WT% @ 25 C (77 F) @ 14.7 psia  
Odor: Ether (slight).  
Form: Liquified Gas.  
Color: Colorless.  
Liquid Densit : 1.21 g/cm<sup>3</sup> @ 25 C (77 F)  
Specific Gravity: 1.208 @ 77 F (25 C)  
Evaporation Rate: (CCL4 = 1); greater than 1

### 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.

#### CONDITIONS TO AVOID

Avoid open flames and high temperatures.

#### POLYMERIZATION

Polymerization will not occur.

### TOXICOLOGICAL INFORMATION

#### ANIMAL DATA

ETHANE, 1,1,1,2-TETRAFLUORO

**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.





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## **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).

## **ECOLOGICAL INFORMATION**

### **ECOTOXICOLOGICAL INFORMATION**

#### **AQUATIC TOXICITY:**

48 hour EC50 - Daphnia magna: 980 mg/L  
96 hour LC50 - Rainbow trout: 450 mg/L

## **DISPOSAL CONSIDERATIONS**

### **RCRA INFORMATION**

Hazardous Waste Not Hazardous Waste  
RCRA ID No N/A

Disposal must comply with federal, state, and local disposal or discharge laws. R-134A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

## **TRANSPORTATION INFORMATION**

### **SHIPPING INFORMATION**

#### **US ICC/ DOT**

Proper Shipping Name: 1,1,1,2-TETRAFLUOROETHANE  
Hazard Class: 2.2  
Packing Group Not Applicable  
UN No.: 3159  
ERG No: 126  
Label: NON-FLAMMABLE GAS

#### **IMO/ IMDG**

Proper Shipping Name: 1,1,1,2-TETRAFLUOROETHANE  
Hazard Class: 2.2  
UN No.: 3159  
Label: NON-FLAMMABLE GAS

#### **ICAO/ IATA**

Proper Shipping Name: 1,1,1,2-TETRAFLUOROETHANE  
Hazard Class: 2.2  
UN No.: 3159  
Label: NON-FLAMMABLE GAS

#### **ICAO/ IATA Maximum Quantity Allowed**

Cargo ≤150kg  
Passenger ≤75kg





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## REGULATORY INFORMATION

### U.S. FEDERAL REGULATIONS

TSCA Inventory Status: Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute: Yes  
Chronic: Yes  
Fire: No  
Reactivity: No  
Pressure: Yes

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance No  
CERCLA Hazardous Substance No  
SARA Toxic Chemical No

WARNING: DO NOT vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. Contains 1,1,1,2-Tetrafluoroethane (HFC-134a), a greenhouse gas which may contribute to global warming.

## OTHER INFORMATION

### NFPA, NPCA-HMIS

NPCA-HMIS Rating		
Health	1	
Flammability	0	
Reactivity	1	

ANSI/ ASHRAE 34 Safety Group – A1

### DISCLAIMER

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### REGULATORY STANDARDS

[OSHA Standards 29 CFR §1910.1200\(g\) HAZARD Communication: Safety Data Sheets](#)

[DOT Title 49 CFR §172.101 List of Hazardous Substances and Reportable Quantities](#)

[ANSI Z400.1/Z129.1-2010 Hazardous Workplace Chemicals - Hazard Evaluation and Safety Data Sheet and Precautionary Labeling Preparation](#)

[NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response](#)

### CID COMMERCIAL ITEM DESCRIPTION

[A-A-58060 Fluorocarbon and Other Refrigerants](#)

### NSN NATIONAL STOCK NUMBER REFERENCE

6830-01-555-8678	6830-01-390-9622	6830-01-412-6362	6830-01-370-6207
6830-01-370-8756	6830-01-527-8354	6830-01-381-2675	6830-01-534-4803



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