



ASPEN® (R-416/FR-12)

The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

AR416FR12 - Revised 05-July-2006

Chemical Product/Company Identification

Tradenames and Synonyms: R-416A, FRIGC® FR-12™ Refrigerant (U.S. Patent # 5425890)

Company Identification: **CFC Refimax, LLC**
5211 Industrial Ct. SE
Smyrna, GA 30080

Phone Numbers: CHEMTREC	Product Information:	U.S. 1-800-424-9300	International 703-527-3887 (Collect)
	Transport Emergency:	1-800-424-9300	703-527-3887 (Collect)
	Medical Emergency:	1-800-424-9300	703-527-3887 (Collect)

Composition/Information on Ingredients

Chemical Name	CAS No.	Wt.-%	Exposure Limit
1,1,1,2-Tetrafluoroethane (R-134a)	811-97-2	59.0	1000 ppm AIHA WEEL
-Chloro-1,2,2,2-Tetrafluoroethane (R-124)	2837-89-0	39.5	1000 ppm AIHA WEEL
Butane (R-600)	106-97-8	1.5	800 ppm ACGIH TLV

Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

Potential Health Effects

NFPA HAZARD IDENTIFICATION

Degree of Hazard:	Health: 2	Fire: 0	Reactivity: 0
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Hazard Ratings: 0: Least, 1: Slight, 2: Moderate, 3: High, 4: Extreme

INHALATION: Avoid inhalation of high concentrations of gas. Acute overexposure may result in irritation of the throat and lungs. High concentrations in confined areas can displace oxygen and can cause dizziness, unconsciousness, and even death with longer exposure. Long-term exposure to this product may cause symptoms of drowsiness, dullness, numbness, headache, dizziness, nausea and increase heart rate.

SKIN CONTACT: Avoid direct skin contact. Direct contact with liquefied/pressurized gas or frost particles may cause severe burns or frostbite ("cold" burns).

EYE CONTACT: Avoid eye contact. Direct contact with liquefied/pressurized gas or frost particles may cause severe and possibly permanent eye damage.

ADDITIONAL INFORMATION: Individuals with preexisting diseases of the central nervous system, cardiovascular system, lungs or kidneys may have increased susceptibility to the toxicity of excessive exposures.

OTHER INFORMATION: The following statement complies with 40cfr III.721.3180 as such applies to R-124 only: Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse can be fatal. Vapor reduces oxygen available for breathing and is heavier than air. Liquid contact causes frostbite. The effects in animals from single exposure by inhalation include central nervous system effects, anesthesia, and decreased blood pressure. Cardiac sensitization occurred in dogs exposed to a concentration of 2.5 percent in air and given an intravenous epinephrine challenge. Repeated exposures produced increased liver weights, anesthetic effects, irregular respiration, poor coordination, and nonspecific



effects such as decreased body weight gain. However, no irreversible effects were seen as evidenced by histopathologic evaluation. As part of an extensive toxicology program, halogenated chlorofluorocarbon-124 will be tested in subchronic, developmental, and chronic/cancer studies. Avoid breathing high concentration of vapor. Use with sufficient ventilation to keep employee exposure below recommended limits. Avoid contact of liquid with skin and eyes. Wear chemical splash goggles and lined butyl gloves. DO NOT allow product to contact open flame or electrical heating elements because dangerous decomposition products may form. R-416A/FR-12 is not carcinogenic, mutagenic, a skin sensitizer, or a reproductive toxin according to the OSHA Hazard Communication Standard (HCS) [29 CFR 1910.1200].

First Aid Measures

INHALATION: Conscious person should be assisted to an uncontaminated area and inhale fresh air. Unconscious person should be moved to an uncontaminated area, given mouth to mouth resuscitation and supplemental oxygen. Do not give epinephrine (adrenaline). Seek immediate medical attention.

SKIN CONTACT: If skin is exposed to liquefied/pressurized gas or frost particles, soak with warm water. If frostbite occurs, do not immerse frozen area into hot water or place in front of a heat source.

EYE CONTACT: If eye is exposed to liquefied/pressurized gas or frost particles, immediately flush eyes with large amounts of water and continue flushing for 15 minutes until irritation subsides.

INGESTION: Not applicable by this route of exposure. Do not attempt to give anything by mouth to an unconscious person. Do not induce vomiting unless instructed to do so by a physician.

NOTES TO PHYSICIANS: Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution only in situations of emergency life support.

Fire Fighting Measures

FLAMMABLE PROPERTIES:	Flash Point:	Non-flammable, Will not burn
	Flammable limits in Air, % by Volume	
	LEL:	Not applicable
	UEL:	Not applicable
	Autoignition:	Unknown

FIRE AND EXPLOSION HAZARDS: Cylinders are equipped with temperature and pressure relief devices but still may rupture under fire conditions. Decomposition may occur. Gas vapors can collect and remain in low spots even after the source of gas has been eliminated. Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. – very high temperatures and/or appropriate pressures). Caution! Contents are under pressure and can explode when exposed to heat or flames.

EXTINGUISHING MEDIA: Extinguishing media is generally not necessary for this material. This material is non-flammable. Use the extinguishing media appropriate for combustibles in area.

FIRE FIGHTING INSTRUCTIONS: Keep containers cool with water spray. Self-contained breathing apparatus (SCBA) is required if cylinders rupture or release under fire conditions. Use water to keep fire exposed containers cool and to protect personnel during shutoff. If possible, stop the flow of gas or vapor, then fight fire according to types of burning material. If flow cannot be safely shut off, allow fire to burn itself out. Cool cylinders with water spray until well after fire is out. Upon exposure to intense heat or flame container may vent rapidly or explode.

Accidental Release Measures

Evacuate all personnel from affected area. Use appropriate protective equipment. If leak is in user's equipment, be certain to purge piping with an inert gas prior to attempting repairs. Comply with Federal, State, and local regulations for reporting releases.

Handling and Storage

HANDLING (PERSONNEL): Do not drag, roll, or slide cylinders. Secure cylinders at all times. Use separate control valves or pressure reducing regulators to safely discharge gas from cylinder. Use a check valve to prevent reverse flow into cylinder, or an increase in pressure, or an increased discharge rate. Compressed gas cylinders must not be refilled except by a qualified producer of gas. Shipment of the compressed gas cylinder which has not been filled by the owner or with the owner's consent, is a violation of federal law. Do not mix with air for leak testing or use with air for any purpose above atmospheric pressure.

STORAGE: Never expose cylinders to excessive heat. Cylinders should be stored in a well-ventilated area. Storage should not exceed 50°C (122°F) and should be free of oxidizers or corrosive materials.



Exposure Controls/Personal Protection

Respiratory Protection:	Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.
Ventilation:	Use hood with forced ventilation and/or local exhaust codes.
Protective Gloves:	Plastic or rubber
Eye Protection:	Safety glasses or goggles
Other Protective Equip:	Safety shoes

Physical and Chemical Properties:

Physical Data:	
Boiling Point:	-24.2°C
Freezing Point:	-101°C.
Vapor Pressure:	4620 torr @ 25°C
Solubility in Water:	1.4 g/l
Odor:	Faint hydrocarbon
Form:	Liquefied gas
Color:	Clear, colorless
Density:	1.33 g/cm ³ - Liquid

Stability and Reactivity

CHEMICAL STABILITY: Material is stable. However, avoid open flames and high temperatures.

CONDITIONS TO AVOID: Do not expose cylinders to temperatures exceeding 50°C, Extreme heat or pressure

POLYMERIZATION: Polymerization will not occur.

DECOMPOSITION: Decomposition products are hazardous

INCOMPATIBILITY: (Materials to avoid) None known.

Disposal Considerations

WASTE DISPOSAL: Comply with Federal, State, and local regulations. Remove to a permitted waste disposal facility or reclaim by distillation.

Transportation Information

SHIPPING INFORMATION:

Proper Shipping Name:	1-Chloro-1,2,2,2-Tetrafluoroethane, 1,1,1,2-Tetrafluoroethane, Butane
Hazard Class:	2.2
UN No:	1078
DOT/IMO Label:	Non-Flammable Gas
Shipping Containers:	Cylinders, Ton Tanks.

DISCLAIMER

The information recommendations and suggestions herein were compiled from reference material and sources believed to be reliable. However, the MSDS accuracy or completeness is not guaranteed by CFC Refimax, LLC, or its affiliates nor is any responsibility assumed or implied for any loss or damage resulting from inaccuracies or omissions. Since conditions of use are beyond our control no warranties of merchantability or fitness for a particular purpose are expressed or implied. This MSDS is not intended as a license to operate under or recommendation to infringe on any patents. Appropriate warnings and safe-handling procedures should be provided to handlers and users. Data contained is based on a worst case condition of one of the constituents used in the refrigerant.

Responsibility for MSDS: MSDS Coordinator
CFC Refimax, LLC
5211 Industrial Ct. SE
Smyrna, GA 30080



This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.
End of MSDS