



## Safety Data Sheet

### R-416A

#### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** R-416A  
**OTHER NAME:** 1,1,1,2-Tetrafluoroethane, 1-Chloro-1,2,2,2-tetrafluoroethane, Butane  
**USE:** Refrigerant Gas  
**DISTRIBUTOR:** National Refrigerants, Inc.  
661 Kenyon Avenue  
Bridgeton, New Jersey 08302

**FOR MORE INFORMATION CALL:**  
(Monday-Friday, 8:00am-5:00pm)  
1-800-262-0012

**IN CASE OF EMERGENCY CALL:**  
CHEMTREC: 1-800-424-9300

#### 2. HAZARDS IDENTIFICATION

**CLASSIFICATION:** Gases under pressure, Liquefied Gas  
**SIGNAL WORD:** WARNING  
**HAZARD STATEMENT:** Contains gas under pressure, may explode if heated  
**SYMBOL:** Gas Cylinder  
**PRECAUTIONARY STATEMENT:** STORAGE: Protect from sunlight, store in a well ventilated place



#### POTENTIAL HEALTH HAZARDS

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

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

**INHALATION:** Avoid inhalation of high concentrations of gas. Acute overexposure may result in irritation of the throat and lungs. High concentrations in confined areas 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.

**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.

#### 3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>	<u>EXPOSURE LIMIT</u>
1,1,1,2-Tetrafluoroethane (R-134a)	811-97-2	59.0	1000 ppm AIHA WEEL
1-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



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**COMMON NAME and SYNONYMS**

R-416A; HCFC-416A

There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2

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**4. FIRST AID MEASURES**

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**SKIN:** 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.

**EYES:** 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.

**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.

**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 PHYSICIAN:** 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.

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**5. FIRE FIGHTING MEASURES**

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**FLAMMABLE PROPERTIES:** Flash Point: Not 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.

**FIRE FIGHTING PRECAUTIONS/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.

**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.



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## 6. ACCIDENTAL RELEASE MEASURES

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Evacuate all personnel from affected area. Product dissipates upon release. 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.

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## 7. HANDLING AND STORAGE

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**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.

**INCOMPATIBILITIES:**

Freshly abraded aluminum surfaces at specific temperatures and pressures may cause a strong exothermic reaction.  
Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

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## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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**ENGINEERING CONTROLS:** Use hood with forced ventilation and/or local exhaust codes.

**PERSONAL PROTECTIVE EQUIPMENT**

**EYE/FACE PROTECTION:** Safety glasses or goggles

**RESPIRATORS:** Positive pressure air line with mask or self-contained breathing apparatus should be available for emergency use.

**PROTECTIVE GLOVES:** Plastic or rubber

**ADDITIONAL RECOMMENDATIONS:** Safety shoes

**EXPOSURE GUIDELINES**

**INGREDIENT NAME**

1,1,1,2-Tetrafluoroethane (R-134a)  
1-Chloro-1,2,2,2-tetrafluoroethane (R-124)  
Butane (R-600)

**EXPOSURE LIMIT**

1000 ppm AIHA WEEL  
1000 ppm AIHA WEEL  
800 ppm ACGIH TLV

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

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**PHYSICAL DATA**

**BOILING POINT:** -24.2°C  
**FREEZING POINT:** -101°C  
**VAPOR PRESSURE:** 4620 torr @ 25°C  
**SOLUBILITY IN WATER (weight %):** 1.4 g/l  
**ODOR:** Faint hydrocarbon



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<b>FORM:</b>	Liquefied gas
<b>COLOR:</b>	Clear, colorless
<b>VAPOR DENSITY (air = 1.0):</b>	1.33 g/cm <sup>3</sup> – Liquid
<b>ODOR THRESHHOLD:</b>	Not established
<b>FLAMMABILITY:</b>	Not applicable
<b>LEL/UEL:</b>	None/None
<b>RELATIVE DENSITY:</b>	1.24 g/cm <sup>3</sup> at 21.1°C
<b>PARTITION COEFF (n-octanol/water)</b>	Not applicable
<b>AUTO IGNITION TEMP:</b>	Not Determined
<b>DECOMPOSITION TEMPERATURE:</b>	>250°C
<b>VISCOSITY:</b>	Not applicable

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## **10. STABILITY AND REACTIVITY**

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

**INCOMPATIBILITY WITH OTHER MATERIALS:** (Materials to Avoid) None known.

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

**POLYMERIZATION:** Will not occur.

**DECOMPOSITION:** Decomposition products are hazardous.

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## **11. TOXICOLOGICAL INFORMATION**

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### **IMMEDIATE (ACUTE) EFFECTS**

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death.

### **DELAYED (SUCCHROIC and CHRONIC) EFFECTS**

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 DOSE TOXICITY**

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.

### **FURTHER INFORMATION**

R-416A is not carcinogenic, mutagenic, a skin sensitizer, or a reproductive toxin according to the OSHA Hazard Communication Standard (HCS) [29 CFR 1910.1200].

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## **12. ECOLOGICAL INFORMATION**

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**Degradability (BOD):** R416A is a gas at room temperature: therefore, it is unlikely to remain in water

**Octanol Water Partition Coefficient:** See section 9



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**13. DISPOSAL CONSIDERATIONS**

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**RCRA**

**Is the unused product a RCRA hazardous waste if discarded?** Not a hazardous waste  
**If yes, the RCRA ID number is:** Not applicable

**OTHER DISPOSAL CONSIDERATIONS:**

Disposal must comply with federal, state, and local disposal or discharge laws

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

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**14. TRANSPORT INFORMATION**

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**US DOT ID NUMBER:** UN1078  
**US DOT PROPER SHIPPING NAME:** Refrigerant Gases n.o.s. (1-Chloro-1,2,2,2-tetrafluoroethane, 1,1,1,2-Tetrafluoroethane)  
**US DOT HAZARD CLASS:** 2.2  
**DOT/IMO LABEL:** Non-Flammable Gas

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**15. REGULATORY INFORMATION**

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**U.S. FEDERAL REGULATIONS**

**TSCA (TOXIC SUBSTANCE CONTROL ACT):** All components of this product are listed on the TSCA Inventory list.

**CERCLA (COMPREHENSIVE RESPONSE COMPENSATION AND LIABILITY ACT) and SARA (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT):**

No "Reportable Quantities" (RQs) or "Threshold Planning Quantities" (TPQs) exist for any of the ingredients in this product.

Any spill or release resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center (800-424-8802) and to your local Emergency Planning Committee.

**SECTION 311 HAZARD CLASS:** Immediate (Acute) Health  
Sudden Release of Pressure

**SECTION 313 TOXIC CHEMICALS:** This product contains a substance which is defined as a toxic chemical under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendment and Reauthorization Act of 1986 (SARA 313) and 40 CFR part 372. See Section 3 Composition/Information on Ingredients for listed chemical.

**ADDITIONAL REGULATORY INFORMATION :**

R-416a is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82. Section 611 of this regulation requires the following label text on all shipments of this product:



**WARNING:** Do not vent to the atmosphere . To comply with provisions of the U.S. Clean Air Act, any residual must be recovered. Contains Chlorotetrafluoroethane, a CFC substance which harms public health and the environment by destroying ozone in the upper atmosphere . Destruction of the ozone layer can lead to increased ultraviolet radiation which,with excess exposure to sunlight, can lead to an increase in skin cancer and eye cataracts. Contains 1,1,1,2-Tetrafluoroethane (HFC-134a). a greenhouse gas which may contribute to global warming.

**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 line butyl gloves. DO NOT allow product to contact open flame or electrical heating elements because dangerous decomposition products may form. R-416A is not carcinogenic, mutagenic, a skin sensitizer, or a reproductive toxin according to the OSHA Hazard Communication Standard (HCS) [29 CFR 1910.1200].

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## 16.OTHER INFORMATION

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**CURRENT ISSUE DATE:** April, 2015  
**PREVIOUS ISSUE DATE:** November, 2012

### NFPA HAZARD IDENTIFICATION

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

### DISCLAIMER:

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