



# Material Safety Data Sheet

## R-414B

### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** R-414B  
**OTHER NAME:** Chlorodifluoromethane, 2-Chloro-1,1,1,2-tetrafluoroethane, 1-Cholor-1,1-difluoroethane, Isobutane  
**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



**EMERGENCY OVERVIEW:** Overexposure may cause dizziness and loss of concentration. At higher levels, central nervous system depression and cardiac arrhythmia may result. Vapors displace air and may cause asphyxiation in confined spaces. Volatile liquid with faint sweetish odor.

#### POTENTIAL HEALTH HAZARDS

**EYE:** Liquid may cause frostbite. Mist may irritate.

**SKIN:** Irritation can result from a defatting action on tissue. Liquid contact may cause frostbite.

**INGESTION:** Unlikely route of exposure. Should it result, discomfort in the gastrointestinal tract would occur.

**INHALATION:** Overexposure may cause dizziness and loss of concentration. At higher levels, central nervous system depression and cardiac arrhythmia may result.

**CHRONIC (CANCER) INFORMATION:** None of the components are designated as carcinogens by IARC, NTP, OSHA, or ACGIH.

**TERATOLOGY (BIRTH DEFECT) INFORMATION:** Not expected to be teratogenic.

**REPRODUCTIVE INDORMATION:** No hazard expected.



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**3. COMPOSITION / INFORMATION ON INGREDIENTS**

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| <u>INGREDIENT NAME</u>                 | <u>CAS NUMBER</u> | <u>WEIGHT %</u> |
|--|-------------------|-----------------|
| Chlorodifluoromethane                  | 75-45-6           | 50              |
| 2-Chloro-1,1,1,2-tetrafluoroethane     | 2837-89-0         | 39              |
| 1-Chloro-1,1-difluoroethane, HCFC-142b | 75-68-3           | 9.5             |
| Isobutane (HC-600a)                    | 75-28-5           | 1.5             |

\*Regulated as a Toxic Chemical under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

**COMMON NAME and SYNONYMS**

R-414B; HCFC-414B

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 CONTACT:** Warm the area gradually by flushing with plenty of water. Get medical attention if there is evidence of tissue damage.
- EYE CONTACT:** Irrigate eyes with running water for at least 15 minutes. Get medical attention.
- INHALATION:** Remove to fresh air. If not breathing, give artificial respiration, administer oxygen and call a physician.
- INGESTION:** Do not induce vomiting. Get medical attention.

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**5. FIRE FIGHTING MEASURES**

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**FLAMMABLE PROPERTIES**

- FLASH POINT:** No flash point  
**FLASH POINT METHOD:** Not applicable  
**AUTOIGNITION:** 635 deg. C (1175 F)  
**UPPER FLAME LIMIT (volume % in air):** None  
**LOWER FLAME LIMIT (volume % in air):** None

**EXTINGUISHING MEDIA:**

The choice of media depends on surrounding materials.

**FIRE AND EXPLOSION HAZARDS:**

Cylinders may rupture under elevated temperatures and/or fire conditions. In concentrations above the recommended exposure limit, open flame will vary in size and color. Eliminate the flame or ignition source and ventilate to disperse the refrigerant vapors. R-414B is not flammable at atmospheric pressure and temperatures below 100 deg. C (212 F). R-414B should not exist with air/excess oxygen at elevated pressures and high temperatures. R-414B can become combustible with combinations of elevated temperatures, pressures, and oxygen, and an ignition source.



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**FIRE FIGHTING INSTRUCTIONS:**

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment. Cool tank/container with water spray. Heat may rupture containers. Fight fire from distance. Contain and neutralize runoff prior to disposal.

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**6. ACCIDENTAL RELEASE MEASURES**

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**SAFEGUARDS (PERSONNEL):**

NOTE: Review FIRE FIGHTING MEASURES and HANDLING sections before proceeding with clean up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean up.

**ACCIDENTAL RELEASE MEASURES:**

Remove or extinguish combustion sources. Evacuate enclosed spaces until gas is dispersed. Stop the release if possible. Ventilate area including low or enclosed spaces. Exhaust outdoors. Contain spill and collect remainder using absorbent material and place in drum approved for waste disposal or recovery.

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**7. HANDLING AND STORAGE**

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**HANDLING (Personnel):** (Always wear recommended personal protective equipment.)

Avoid breathing vapors. Avoid contact with eyes or skin. Use insulated or lined butyl gloves, face shield or goggles, and impervious clothing. Do not smoke.

**HANDLING (Physical Aspects):**

Insure adequate ventilation to keep exposure below recommended limits. Avoid contact with chlorine or other oxidizing agent.

See Fire and Explosion Data Section

R-414B should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

**STORAGE RECOMMENDATIONS:**

Do not store cylinders in direct sun or expose to heat above 120 deg. F (52 C).

**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:**

Avoid contact with skin or eyes. Avoid breathing vapors. Use with sufficient ventilation to keep exposure below recommended exposure limit. Utilize mechanical ventilation in case of low or enclosed spaces, or release of large quantity.

**PERSONAL PROTECTIVE EQUIPMENT**

**EYE/FACE PROTECTION:**

Goggles or face shield.

**RESPIRATORY PROTECTION:**

Use if exposure level is above the PEL.



**PROTECTIVE CLOTHING:**

Impervious.

**HYGIENE MEASURES:**

Do not drink, eat, or smoke in workplace.

**EXPOSURE GUIDELINES:**

Long Term Exposure Limit \*\*: 1000 ppm (8 hr. TWA reference period)

**INDIVIDUAL COMPONENT APPLICABLE EXPOSURE LIMITS:**

|   |   |  |
|---|---|--|
| 2-Chloro-1,1,1,2-tetrafluoroethane (HCFC-124) | WEEL (AIHA)                             | 1000 ppm-8 hr. TWA   |
| Chlorodifluoroethane (HCFC-22)                | PEL (OSHA)<br>TLV (ACGIH)               | 1000 ppm-8 hr. TWA<br>1000 ppm-8 hr. TWA   |
| 1-Chloro-1,1-difluoroethane, (HCFC 142b)      | WEEL (AIHA)                             | 1000 ppm-8hr. TWA  |
| Isobutane (HC-600a)                           | TLV (ACGIH)<br>DFG MAK:<br>TWA (NIOSH): | 1000 ppm-8hr. TWA<br>1000 ppm-2350 mg/m3<br>Peak limitation category<br>800 ppm: 1900 mg/m3<br>Recommended TWA 10 hrs. |

**9. PHYSICAL AND CHEMICAL PROPERTIES**

|  |                                  |                              |
|--|----------------------------------|------------------------------|
| <b>COLOR:</b>                            | Colorless                        |                              |
| <b>PHYSICAL STATE:</b>                   | Gas at ambient temperatures      |                              |
| <b>MOLECULAR WEIGHT:</b>                 | 101.59 g/mol                     |                              |
| <b>ODOR:</b>                             | Slight ethereal                  |                              |
| <b>SOLUBILITY IN WATER (weight %):</b>   | Not Determined                   |                              |
| <b>pH:</b>                               | Neutral                          |                              |
| <b>BOILING POINT:</b>                    | Dew @ 1 atm. -11.8 deg. F        | Bubble @ 1 atm. -27.1 deg. F |
| <b>FREEZING POINT:</b>                   | Not determined                   |                              |
| <b>VAPOR PRESSURE:</b>                   | 78.9 psia @ 70 deg. F            | 195.4 psia @ 130 deg. F      |
| <b>VAPOR DENSITY:</b>                    | Liquid @ 1 atm. 86.95 lb/ft3     | Vapor @ 1 atm. .32255 lb/ft3 |
| <b>% VOLATILES:</b>                      | 100                              |                              |
| <b>ODOR THRESHHOLD:</b>                  | Not established                  |                              |
| <b>FLAMMABILITY:</b>                     | Not applicable                   |                              |
| <b>LEL/UEL:</b>                          | None/None                        |                              |
| <b>RELATIVE DENSITY:</b>                 | 1.23 g/cm <sup>3</sup> at 21.1°C |                              |
| <b>PARTITION COEFF (n-octanol/water)</b> | Not applicable                   |                              |
| <b>AUTO IGNITION TEMP:</b>               | 635°C                            |                              |
| <b>DECOMPOSITION TEMPERATURE:</b>        | >250°C                           |                              |
| <b>VISCOSITY:</b>                        | Not applicable                   |                              |
| <b>FLASH POINT:</b>                      |                                  | Not Applicable               |
| <b>EVAPORATION RATE:</b>                 |                                  | None Determined              |



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**10. STABILITY AND REACTIVITY**

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**CHEMICAL STABILITY:**

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

**POLYMERIZATION:**

Will not occur.

**DECOMPOSITION:**

Decompositions are hazardous. High temperatures or flames will cause decomposition by products forming halogens, halogen acids and possible carbonyl halides.

**OTHER HAZARDS:**

Cylinders of used product may contain oil as well as refrigerant. A leak or venting during a fire will produce a cloud of oil mist that is flammable.

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**11. TOXICOLOGICAL INFORMATION**

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**IMMEDIATE (ACUTE) EFFECTS:** Components

**AS BLENDED:** Untested

HCFC-22: Inhalation 4 hr. LC50 (rat) >250,000 ppm  
Cardiac Sensitivity Threshold (dog) >50,000 ppm

HCFC-142b: 4 hr. LC50 (rat) >800,000 ppm  
Cardiac Sensitivity Threshold (dog) >75,000 ppm

HCFC-142b: Inhalation 4 hr. LC50 (rat) >128,000 ppm  
Cardiac Sensitivity Threshold NOEL >50,000 ppm

HC-600a: 2 hr. LC50 (mouse) 520,000 ppm

**REPEATED DOSE TOXICITY:**

Lifetime inhalation exposure of male rats was associated with a small increase in salivary gland fibrosarcomas.

**FURTHER INFORMATION:**

Acute effects of rapid evaporation of the liquid may cause frostbite. Vapors are heavier than air and can displace oxygen causing difficulty breathing or suffocation. May cause cardiac arrhythmia.

**POTENTIAL HEALTH HAZARDS**

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**TERATOLOGY (BIRTH DEFECT) INFORMATION:** Not expected to be teratogenic.

**REPRODUCTIVE INFORMATION:** No hazard expected



**12. ECOLOGICAL INFORMATION**

**DEGRADABILITY (BOD):** R-414B is a gas at room temperature. It is unlikely to remain in water.

Octanol Water Partition Coefficient: See section 9

Components: R-22 – unknown R-124 – Log Pow = 1.94  
R-142b – unknown R-600a – Log Pow = 2.8

**13. DISPOSAL CONSIDERATIONS**

Disposal must comply with federal, state, and local regulations. R-141B is subject to Clean Air Act Regulations Section 608 in 40 CFR Part 82 concerning refrigerant recycling.

**RCRA:** Not a hazardous waste

Alteration to the product such as mixing with other material may change the characteristics of the material and alter the RCRA classification and the proper disposal method.

**14. TRANSPORT INFORMATION**

**US DOT ID NUMBER:** UN3163  
**US DOT PROPER SHIPPING NAME:** Liquefied gas, n.o.s., (Chlorodifluoromethane, Chlorodifluoroethane, Chlorotetrafluoroethane)  
**US DOT HAZARD CLASS:** 2.2  
**US DOT PACKING GROUP:** Not applicable

**15. REGULATORY INFORMATION**

**TOXIC SUBSTANCES CONTROL ACT (TSCA)**

**TSCA INVENTORY STATUS:** Components listed on the TSCA inventory

**SARA TITLE III/CERCLA:** Components: Section 311 Hazard Class: IMMEDIATE PRESSURE  
Reportable Quantities (RQs) No components listed Section 313 Toxic Chemicals: No components listed  
Threshold Planning Quantities (TPQs) No components listed

**Additional Regulatory Information:**  
U.S. Clean Air Act – 40 CFR Part 82

**WHMIS Classification (Canada):** This product has been evaluated with the hazard criteria of the CPR, and the MSDS contains all the information required by the CPR.

**Foreign Inventory Status:** Components:  
EU-EINECS #2008719 – HCFC – 22  
#2008918 – HCFC – 142b  
#2206296 – HCFC – 124  
#2008572 – HF – 600A

**16. OTHER INFORMATION**

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



**OTHER INFORMATION:**

HMIS Classification: Health – 1, Flammability – 1, Reactivity – 0  
NFPA Classification: Health – 2, Flammability – 1, Reactivity – 0  
ANSI / ASHRAE 34 Safety Group – A1

Regulatory Standards:

1. OSHA regulations for compressed gases: 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101

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