



NATIONAL REFRIGERANTS, INC.

R-422C

Safety Data Sheet

R-422C

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R-422C
OTHER NAME: 1,1,1,2,2-Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, 1,1,1,2-Tetrafluoroethane
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: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250°C), decomposition products may include Hydrochloric acid (HCl), Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH HAZARDS

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

EYE: Liquid may cause frostbite. Mist may irritate.

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

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

DELAYED EFFECTS:

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

TERATOLOGY (BIRTH DEFECT) INFORMATION: No hazard expected.



Ingredients found on one of the OSHA designated carcinogen lists are listed below.

| <u>INGREDIENT NAME</u> | <u>NTP STATUS</u> | <u>IARC STATUS</u> | <u>OSHA LIST</u> |
|---------------------------------------|-------------------|--------------------|------------------|
| No ingredients listed in this section | | | |

3. COMPOSITION / INFORMATION ON INGREDIENTS

| <u>INGREDIENT NAME</u> | <u>CAS NUMBER</u> | <u>WEIGHT %</u> |
|--|-------------------|-----------------|
| *1,1,1,2,2-Pentafluoroethane (HFC - 125) | 354-33-6 | 82% |
| *1,1,1,2-Tetrafluoroethane (HFC - 134A) | 811-97-2 | 15% |
| Isobutane (HC - 600A) | 75-28-5 | 3% |

COMMON NAME and SYNONYMS

R-422C; HFC422C

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

4. FIRST AID MEASURES

SKIN: Warm the area gradually by flushing with plenty of water. Get medical attention if there is evidence of tissue damage.

EYES: 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.
DO NOT give epinephrine or similar drugs.

INGESTION: Do not induce vomiting. Get medical attention.

ADVICE TO PHYSICIAN:

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

| | |
|---|---------------------------|
| FLASH POINT: | None |
| FLASH POINT METHOD: | Not applicable |
| AUTOIGNITION TEMPERATURE: | >550 deg. C (1022 deg. F) |
| UPPER FLAME LIMIT (volume % in air): | None |
| LOWER FLAME LIMIT (volume % in air): | None |
| FLAME PROPAGATION RATE (solids): | Not applicable |
| OSHA FLAMMABILITY CLASS: | Not applicable |

EXTINGUISHING MEDIA:

The choice of media depends on surrounding materials.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

Cylinders may rupture under elevated temperatures and /or fire conditions. In concentration 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.



Refrigerant 422C is not flammable at atmospheric pressure and temperatures below 100 deg. C. Refrigerant 422C should not exist with air/excess oxygen at elevated pressures and high temperatures. Refrigerant 422C can become combustible with combinations of elevated temperatures, pressures, and oxygen, and an ignition source. For example: Do not mix Refrigerant 422C with air under pressure for leak detection purposes.

SPECIAL FIRE FIGHTING PRECAUTIONS/ 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.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE:

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

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.

Spills and releases may have to be reported to Federal and/ or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING:

Avoid breathing vapors. Avoid contact with skin or eyes. Use insulated or lined butyl gloves, face shield or goggles, and impervious clothing. Do not smoke. Insure adequate ventilation to keep exposure below recommended limits. Avoid contact with chlorine or other oxidizers. See Fire and Explosion Data section.

STORAGE RECOMMENDATIONS:

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

INCOMPATIBILITIES:

Refer to the detailed list of incompatible materials (section 10 "Stability/Reactivity). Incompatible with magnesium and its alloys, zinc and its alloys, and aluminum alloys containing more than 2% magnesium.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

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:

SKIN PROTECTION:

Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

**EYE PROTECTION:**

For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION:

None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained NIOSH approved breathing apparatus or supplied air respirator. For escape: use the former or a NIOSH approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS:

Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

EXPOSURE GUIDELINES

| INGREDIENT NAME | ACGIH TLV | OSHA PEL | OTHER LIMITS |
|---------------------------|--------------------|----------|-----------------------|
| Pentafluoroethane | None | None | *1000 ppm TWA (8hr) |
| 1,1,1,2-Tetrafluoroethane | None | None | *1000 ppm TWA (8hr) |
| Isobutane | 1000 ppm TWA (8hr) | None | ** 800 ppm TWA (10hr) |

* = Workplace Environmental Exposure Level (AIHA).

** = National Institute of Occupational Safety & Health (NIOSH).

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Impervious gloves, chemical splash goggles, and impermeable clothing should be worn when handling refrigerant. Under normal conditions, no respiratory protection is required when using this product. Self-container breathing apparatus, (SCBA) is required in the even of insufficient ventilation. Do not drink, eat or smoke in the workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|--|
| APPEARANCE: | Colorless |
| PHYSICAL STATE: | Gas at ambient temperature |
| MOLECULAR WEIGHT: | 113.49 g/mol |
| CHEMICAL FORMULA: | |
| ODOR: | Slight ethereal |
| SPECIFIC GRAVITY (water = 1.0): | |
| SOLUBILITY IN WATER (weight %): | Not Determined |
| pH: | Neutral |
| BOILING POINT: | Dew @ 1 atm. -45.1 deg. F Bubble @ 1 atm. -50.7 deg. F |
| FREEZING POINT: | Not determined |
| VAPOR PRESSURE: | @ 70 deg. F 155.6 psia @ 130 deg. F 360.1 psia |
| VAPOR DENSITY (air = 1.0):: | Liquid @ 1atm. 89.20 lb/ft ³ Vapor @ 1 atm. .3912 lb/ft. ³ |
| EVAPORATION RATE: | |
| % VOLATILES: | 100 |
| ODOR THRESHHOLD: | |
| FLAMMABILITY: | |
| LEL/UEL: | |
| RELATIVE DENSITY: | |
| PARTITION COEFF (n-octanol/ water) | |



AUTO IGNITION TEMP:

DECOMPOSITION TEMPERATURE:

VISCOSITY:

FLASH POINT:

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE: (CONSTIONS TO AVOID):

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

INCOMPATIBILITES:

Incompatible with alkali or or alkaline earth metals, powdered metals, magnesium.

HAZARDOUS DECOMPOSITION PRODUCTS:

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

HAZARDOUS POLYMERIZATION:

Will not occur.

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.

11. TOXICOLOGICAL INFORMATION

Immediate (Acute) Effects:

As Blended: Untested

HFC-134a:

| | |
|-------------------------------|--------------|
| LC50: 4hr. (rat) | >500,000 ppm |
| Cardiac Sensitivity Threshold | 80,000 ppm |
| NOEL | 50,000 ppm |

HFC-125:

| | |
|-------------------------------|--------------|
| LC50: 4hr. (rat) | >800,000 ppm |
| Cardiac Sensitivity Threshold | 75,000 ppm |

HC-600a:

| | |
|--------------------|--------------|
| LC50: 2hr. (mouse) | >520,000 ppm |
|--------------------|--------------|

POTENTIAL HEALTH HAZARDS

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

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



DELAYED EFFECTS: None known

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

TERATOLOGY (BIRTH DEFECT) INFORMATION: No hazard expected.

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

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|---------------------------------------|-------------------|--------------------|------------------|
| No ingredients listed in this section | | | |

12. ECOLOGICAL INFORMATION

DEGRADABILITY:

Refrigerant 422C is a gas at room temperature. It is unlikely to remain in water.

Octanol Water Partition Coefficient: As blended N/A

Components: R-134a – Log Pow = 1.06
R-125 – Log Pow = 1.48
R-600a – Log Pow = 2.8

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL:

Disposal must comply with federal, state, and local regulations. Refrigerant 422C is subject to Clean Air Act Regulations Section 608 in 40 CFR Part 82 concerning refrigerant recycling.

RCRA: 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 (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane)

US DOT HAZARD CLASS: 2.2

US DOT PACKING GROUP: N/A

15. REGULATORY INFORMATION

TOXIC SUBSTANCE CONTROL ACT (TSCA)

Components: Listed on Inventory

SARA TITLE III/CERCLA: Components:

| | |
|---------------------------------------|----------------------|
| Reportable Quantities (RQs): | No components listed |
| Threshold Planning Quantities (TPQs): | No components listed |



| | |
|-----------------------------|----------------------|
| Section 311 Hazard Class: | IMMEDIATE PRESSURE |
| Section 313 Toxic Chemical: | No components listed |

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.

ADDITIONAL REGULATORY INFORMATION: U. S. Clean Air Act – 40 CFR Part 82

16. OTHER INFORMATION

HMIS Classification:

| | |
|--------------|---|
| Health | 1 |
| Flammability | 1 |
| Reactivity | 0 |

NFPA Classification:

| | |
|--------------|---|
| Health | 2 |
| Flammability | 1 |
| Reactivity | 0 |

OSHA Regulations for compressed gases: 29CFR 1910.11
ANSI/ASHRAE: Standard 34 Safety Designation – A1

DOT Classification per 49 CFR 172.101

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