



## Safety Data Sheet

### R-422A

#### 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

**PRODUCT NAME:** R-422A  
**OTHER NAME:** Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, Isobutane  
**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

<b>CLASSIFICATION:</b>	Gases under pressure, Liquefied Gas
<b>SIGNAL WORD:</b>	WARNING
<b>HAZARD STATEMENT:</b>	Contains gas under pressure, may explode if heated
<b>SYMBOL:</b>	Gas Cylinder
<b>PRECAUTIONARY STATEMENT:</b>	<b>STORAGE:</b> 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.

**EYES:** 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:** None Known

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

**TERTATOLOGY (BIRTH DEFECT) INFORMATION:** No hazard expected

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



**INGREDIENT NAME**

**NTP STATUS**

**IARC STATUS**

**OSHA LIST**

No ingredients listed in this section

**3. COMPOSITION / INFORMATION ON INGREDIENTS**

**INGREDIENT NAME**

**CAS NUMBER**

**WEIGHT %**

Pentafluoroethane	354-33-6	85.1%
1,1,1,2-Tetrafluoroethane	811-97-2	11.5%
Isobutane	75-28-5	3.4%

**COMMON NAMES and SYNONYMS**

R-422A; HFC422A

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

**4. FIRST AID MEASURES**

**INHALATION:** Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Get medical attention immediately.

**SKIN:** Promptly flush skin with lukewarm water. Do not use hot water. Immediately remove contaminated clothing or footwear. If it sticks, do not pull it off. Cover the affected area with a sterile dressing. Get medical attention immediately.

**EYES:** Immediately flush eyes with large amounts of water for at least 15 minutes keeping the eyes wide open. Consult an eye specialist immediately.

**INGESTION:** Not specifically applicable (gas).

**ADVICE TO PHYSICIAN:** Avoid administering adrenaline or any other similar products.

**5. FIRE FIGHTING MEASURES**

**FLAMMABLE PROPERTIES**

<b>FLASH POINT:</b>	None
<b>FLASH POINT METHOD:</b>	Not Applicable
<b>AUTOIGNITION TEMPERATURE:</b>	>550°C (1022°F)
<b>UPPER FLAME LIMIT (volume % in air):</b>	None*
<b>LOWER FLAME LIMIT (volume % in air):</b>	None*
	*Based on ASHRAE Standard 34 with match ignition
<b>FLAME PROPAGATION RATE (solids):</b>	Not applicable
<b>OSHA FLAMMABILITY CLASS:</b>	Not applicable

**EXTINGUISHING MEDIA:**

All suitable extinguishing agents can be used.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

Pressurized container. On heating there is a risk of bursting due to internal pressure build-up. NOT flammable. However, it may present a risk in the event of a fire. Toxic vapours (halogen compounds) are released.



**SPECIAL FIRE FIGHTING PRECAUTIONS INSTRUCTIONS:**

Stay upwind. Evacuate all personnel away from the fumes. Cool down the containers/equipment exposed to heat with a water spray. Fire-fighters must use self-contained breathing apparatus.

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**6. ACCIDENTAL RELEASE MEASURES**

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**SAFEGUARDS (Personnel):**

Avoid contact with skin and eyes. Do not breathe gas. No naked flames. Do not smoke. For further information refer to section 8 "Exposure controls/personal protection." Heavy vapours. Shut off low-level openings in the vicinity (ventilation shafts, drains. . .). Prevent the product from entering cellars, basements or pits. Stop the leak. Ventilate spillage area. Ventilate basements.

**ENVIRONMENTAL PRECAUTIONS:**

Prevent the product from spreading into the environment. Contain the spilled material by bunding.

**METHODS FOR CLEANING UP**

Recover: Recover as much of the product as possible.  
Cleaning/Decontamination: Allow residual product to evaporate.  
Disposal: For disposal of contaminated materials refer to section 13: "Disposal Considerations"

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**7. HANDLING AND STORAGE**

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**HANDLING (Personnel):**

Avoid breathing vapors and liquid contact with eyes, skin or clothing. Use with sufficient ventilation to keep employee exposure below recommended limits. Avoid contact with hot surfaces. Avoid high temperatures. Smoking is forbidden.

**STORAGE RECOMMENDATIONS:**

Storage facilities should be equipped with ventilation at low level. Take all necessary precautions to avoid the accidental release of the product outside, due to the rupture of containers or transfer system. Keep the container tightly closed and dry in a cool, well-ventilated area. Keep at temperatures not exceeding 45° and away from any source of heat or ignition.

**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

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**8. EXPOSURE CONTROLS / PERSONAL PROTECTION**

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**ENGINEERING CONTROLS:**

Ensure good ventilation of the work station.

**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:**



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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**

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
1,1,1,2,2-Pentabluoroethane(R-125)	None	None	*1000 ppm TWA (8 hr)
1,1,1,2-Tetrafluoroethane (R-134a)	None	None	*1000 ppm TWA (8 hr)
Isobutane	1000 ppm TWA (8 hr)	None	**800 ppm TWA (10 hr)

- \* = 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-contained breathing apparatus (SCBA) is required in the event of insufficient ventilation. Do not drink, eat or smoke in the workplace.

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**9. PHYSICAL AND CHEMICAL PROPERTIES**

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<b>APPEARANCE:</b>	Colorless
<b>PHYSICAL STATE:</b>	Compressed liquefied gas
<b>MOLECULAR WEIGHT:</b>	113.6
<b>CHEMICAL FORMULA:</b>	CF <sub>3</sub> CHF <sub>2</sub> ,CF <sub>3</sub> CH <sub>2</sub> F,C <sub>4</sub> H <sub>10</sub>
<b>ODOR:</b>	Slight ethereal
<b>SPECIFIC GRAVITY:</b>	1.157 @25°C
<b>pH:</b>	Not applicable
<b>BOILING POINT:</b>	-46.2°C to -41.5°C
<b>FREEZING POINT:</b>	Soluble in common solvents
<b>VAPOR PRESSURE:</b>	1220 kPa, @ 25°C
<b>VAPOR DENSITY (air =1.0):</b>	3.93
<b>EVAPORATION RATE:</b>	>1 (CC1 <sub>4</sub> +1)
<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>	1.157 g/cm <sup>3</sup> @ 25°C
<b>PARTITION COEFF (n-octanol/water)</b>	Not applicable
<b>AUTO IGNITION TEMP:</b>	Not determined
<b>DECOMPOSITION TEMPERATURE:</b>	>250°C



**VISCOSITY:** Not applicable  
**FLASH POINT:** Not applicable  
(Flash point method and additional flammability data are found in Section 5)

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**10. STABILITY AND REACTIVITY**

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**NORMALLY STABLE (CONDITIONS TO AVOID):**

The product is stable. However, avoid open flames and high temperatures.

**INCOMPATIBILITIES:**

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

**HAZARDOUS DECOMPOSITION PRODUCTS:**

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.

**HAZARDOUS POLYMERIZATION:**

Will not occur.

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**11. TOXICOLOGICAL INFORMATION**

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**IMMEDIATE (ACUTE) EFFECTS:**

HFC-125: LC50 : 4 hr. (rat) - > 800,000 ppm  
Cardiac Sensitization threshold (dog) 75,000 ppm.  
HFC-134a: LC50 : 4 hr. (rat) - > 500,000 ppm  
Cardiac Sensitization threshold (dog) 80,000 ppm.  
R-600a: LC50 : 15 min. (rat) - 570,000 ppm

**DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:**

HFC-125: Teratogenic NOEL (rat and rabbit) – 50,000 ppm  
Subchronic inhalation (rat) NOEL - >50,000 ppm  
Chronic NOEL – 10,000 ppm  
HFC-134a: Teratogenic NOEL (rat and rabbit) – 40,000 ppm  
Subchronic inhalation (rat) NOEL - 50,000 ppm  
Chronic NOEL – 10,000 ppm  
R-600a: Subchronic inhalation (rat) NOAEL - 4,489 ppm

**OTHER DATA:**

HFC-125, HFC-134a: Not active in four genetic studies  
R-600a: Negative Ames test with and without activation

**POTENTIAL HEALTH HAZARDS**

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

**EYES:** 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:** None Known

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

**TERTATOLOGY (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			

**12. ECOLOGICAL INFORMATION**

**MOBILITY**

**Volatility:** Product is volatile when in aqueous solution.

**Expected behavior of the product:**

**BIODEGRADABILITY**

**Ultimate aerobic biodegradability:** Not readily biodegradable. (evaluation by structure-activity relationship)

**BIOACCUMULATION**

**Bioconcentration factor:** No information available.

**ECOTOXICITY**

**--Effects on the aquatic environment:** No information available.

**13. DISPOSAL CONSIDERATIONS**

**WASTE DISPOSAL:**

Do not allow product to be released into the environment. Disposal must comply with federal, state, and local disposal or discharge laws. Consult the manufacturer or supplier for information regarding recovery and recycling of the product. If recovery is not possible, incinerate at a licensed installation.

**CONTAMINATED PACKAGING**

**Decontamination/Cleaning:**

De-gas

**Destruction/Disposal:**

Re-usable containers: Return to the supplier

Disposable containers: Dispose of at an authorized landfill site.

**NOTE:**

The user's attention is drawn to the possible existence of local regulations regarding disposal.

**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 PACKAGING GROUP:** N/A

**NOTE:** The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transport regulations for hazardous materials, it would be advisable to check their validity with your sales office.

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**15. REGULATORY INFORMATION**

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**LABELLING**

**EC REGULATIONS:** Mandatory labeling (self-classification) of hazardous preparations: Not applicable

**-R phrases** No R phrases  
**-S phrases** No S phrases

**NOTE:** The regulatory information given above only indicates the principal regulations specifically applicable to the product described in the Material Safety Data Sheet. The user's attention is drawn to the possible existence of additional provisions which complete these regulations. Refer to all applicable national, international and local regulations or provisions.

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**16. OTHER INFORMATION**

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

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