



## MATERIAL SAFETY DATA SHEET

### 1. CHEMICAL PRODUCT AND COMPANY INFORMATION

**PRODUCT NAME:** Refrigerant R-417a  
**OTHER/GENERIC NAMES:** HFC-R417a;  
**PRODUCT USE:** Refrigerant  
**EXIM TRADING LLC** 12601 NW 115<sup>TH</sup> Ave, Unit 111A, Medley, FL, 33178  
☎ (305) 884 7882 📠 (305) 884 7883

#### FOR EMERGENCY

Medical: 1-800-498-5701  
Transportation: Chemtrec 1-800-424-9300  
OUTSIDE UNITED STATES, CALL COLLECT 1-352-323-3500

### 2. COMPOSITION/INFORMATION ON INGREDIENTS

<b>INGREDIENT NAME</b>	<b>CAS NUMBER</b>	<b>WEIGHT %</b>
Pentafluoroethane (HFC-R125)	354-33-6	46.60
Norflurane (HFC-R134a)	811-97-2	50.00
n-Butane	106-97-8	3.40

### 3. HAZARDS IDENTIFICATION

#### EMERGENCY OVERVIEW:

**Warning! Container under pressure. This product is not flammable at ambient temperatures and atmospheric pressure. Gas reduces oxygen available for breathing. Causes asphyxiation in high concentrations. The victim will not realize that he/she is suffocating. Inhalation may cause central nervous system effects. May cause cardiac arrhythmia. May cause drowsiness and dizziness. Do not breathe vapors. Irritating to eyes and skin. Avoid contact with skin, eyes and clothing. At higher temperatures, (>250°C), decomposition products may include hydrochloric acid (HCl), hydrofluoric acid (HF) and carbonyl halides. The ACGIH Threshold Limit Values (2007) for Hydrogen Fluoride are TLV-TWA 0.5 ppm and Ceiling Exposure Limit 2 ppm.**



**FORM:** Liquefied gas  
**COLOR:** Colorless  
**ODOR:** Faint, sweet odor

**POTENTIAL HEALTH HAZARDS**

**SKIN:** Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite. Irritating to skin.

**EYES:** Liquid contact can cause severe irritation and frostbite. Mist may irritate.

**INHALATION:** Gas reduces oxygen available for breathing. When oxygen levels in air are reduced to 12–14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. The victim will not realize that he/she is suffocating. At high levels, cardiac arrhythmia may occur. Vapors may cause drowsiness and dizziness.

**INGESTION:** Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

**DELAYED EFFECTS:** None known

**CARCINOGENICITY**

No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

**TERATOLOGY (BIRTH DEFECT) INFORMATION:**

Not expected to be teratogenic.

**REPRODUCTIVE INFORMATION:**

No hazard expected.

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**4. FIRST AID MEASURES**

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**SKIN:**

Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

**EYES:**

Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

**INHALATION:**

Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention. Do not give drugs from adrenaline-ephedrine group.

**INGESTION:**



Ingestion is unlikely because of the physical properties and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician. Call a physician immediately.

**ADVICE TO PHYSICIAN:**

Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions. Treat frostbitten areas as needed.

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**5. FIRE FIGHTING MEASURES**

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**FLAMMABLE PROPERTIES**

**FLASH POINT:** Gas, not applicable per DOT regulations  
**IGNITION TEMPERATURE:** <750 °C (1,382 °F)  
**UPPER EXPLOSION LIMIT:** None  
**LOWER EXPLOSION FLAME LIMIT:** None

**EXTINGUISHING MEDIA:**

The product is not flammable. ASHRAE 34. Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide. Use any standard agent – choose the one most appropriate for type of surrounding fire.

**SPECIFIC HAZARDS DURING FIRE FIGHTING**

Contents under pressure. This product is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible when mixed with air under pressure and exposed to strong ignition sources.

Container may rupture on heating. Cool closed containers exposed to fire with water spray. Do not allow run-off from fire fighting to enter drains or water courses. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.

In case of fire hazardous decomposition products may be produced such as:

- |                      |                                   |
|----------------------|-----------------------------------|
| Hydrogen halides     | Hydrogen fluoride                 |
| Carbon monoxide (CO) | Carbon dioxide (CO <sub>2</sub> ) |
| Carbonyl halides     |                                   |

**SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:**

In the event of fire and/or explosion do not breathe fumes. Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

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**6. ACCIDENTAL RELEASE MEASURES**

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**IN CASE OF SPILL OR OTHER RELEASE:** (Always wear recommended personal protective equipment)



Immediately evacuate unprotected personnel to safe areas. Keep people away from and upwind of spill/leak. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Avoid skin contact with leaking liquid (danger of frostbite). Ventilate the area. After release, disperses into the air. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid accumulation of vapors in low areas. Unprotected personnel should not return until air has been tested and determined safe. Ensure that the oxygen content is  $\geq 19.5\%$ .

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

**ENVIRONMENTAL PRECAUTIONS:**

Prevent further leakage or spillage if safe to do so. The product evaporates readily.

**METHODS FOR CLEANING UP:**

Ventilate the area.

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**7. HANDLING AND STORAGE**

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**NORMAL HANDLING:**

(Always wear recommended personal protective equipment)

Handle with care. Avoid breathing vapors or mist. Avoid liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders. Use authorized cylinders only.

**ADVICE ON PROTECTION AGAINST FIRE AND EXPLOSION**

The product is not flammable. Can form a combustible mixture with air at pressures above atmospheric pressure.

**STORAGE RECOMMENDATIONS:**

Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Do not remove screw cap until immediately ready for use. Close valve tightly after use and when empty. Always replace cap after use.

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**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

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**PROTECTIVE MEASURES:**

Do not breathe vapors. Avoid contact with skin, eyes and clothing. Ensure that eyewash stations and safety showers are close to the workstation location.

**ENGINEERING CONTROLS:**



Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

**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 the 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:**

In case of insufficient ventilation wear suitable respiratory equipment. Wear a positive-pressure supplied-air respirator. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. For rescue and maintenance work in storage tanks use self-contained, NIOSH -approved breathing apparatus or supplied air respirator.

**HYGIENE MEASURES**

Handle in accordance with good industrial hygiene and safety practice. Ensure adequate ventilation, especially in confined areas. Avoid contact with skin, eyes and clothing. Remove and wash contaminated clothing before re-use. Keep working clothes separately.

**EXPOSURE GUIDELINES**

Pentafluoroethane	354-33-6	WEEL	TWA	1,000 ppm	4,900 mg/m <sup>3</sup>
1,1,1,2-Tetrafluoroethane	811-97-2	WEEL	TWA	1,000 ppm	4,240 mg/m <sup>3</sup>
n-Butane	106-97-8	TLV ACGIH	TWA	1,000 ppm	
		PEL OSHA	TWA	800 ppm	1,900 mg/m <sup>3</sup>

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**9. PHYSICAL AND CHEMICAL PROPERTIES**

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- FORM** : Liquefied gas
- APPEARANCE** : Clear, colorless vapor
- PHYSICAL STATE** : Gas at ambient temperatures
- ODOR** : Faint, sweet odor
- Ph** : Neutral
- BOILING POINT** : -40.8 °C (-41.4°F)
- VAPOUR PRESSURE** : 9,720 hPa at 25 °C (77 °F)
- SPECIFIC GRAVITY (water = 1.0)** : 1.21
- VAPOR DENSITY (air = 1.0)** : 2.3
- WATER SOLUBILITY (% weight)** : 0.12% at 77°F

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## 10. STABILITY AND REACTIVITY

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### CONDITIONS TO AVOID:

Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C. Decomposes under high temperature. Some risk may be expected of corrosive and toxic decomposition products. Can form a combustible mixture with air at pressures above atmospheric pressure. Do not mix with oxygen or air above atmospheric pressure.

### MATERIALS TO AVOID:

- Finely divided aluminum
- Powdered metals
- Zinc
- Potassium
- Aluminum
- Calcium
- Magnesium

### HAZARDOUS DECOMPOSITION PRODUCTS:

In case of fire hazardous decomposition products may be produced such as:

- Hydrogen halides
- Carbon monoxide (CO)
- Gaseous hydrogen fluoride (HF)
- Carbon dioxide (CO<sub>2</sub>)

**THERMAL DECOMPOSITION:** >250°C.

To avoid thermal decomposition, do not overheat.

### HAZARDOUS POLYMERIZATION:

Will not occur. Stable under normal conditions

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## 11. TOXICOLOGICAL INFORMATION

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### ACUTE INHALATION TOXICITY:

#### HFC-125

LC<sub>50</sub> rat

Dose: > 800,000 ppm

Exposure time: 4 h

Test substance: Ethane, pentafluoro- (HFC-125)

#### HFC 134A

LC<sub>50</sub> rat

Dose: > 500,000 ppm

Exposure time: 4 h

Test substance: 1,1,1,2-tetrafluoroethane (HFC-134a)

#### n-Butane

LC<sub>50</sub> rat

Dose: > 270,000 ppm

Exposure time: 4 h

Test substance: n-Butane



**ADDITIONAL ADVICE:**

Acute Health Hazard

Ethane, pentafluoro- (HFC-125):

Cardiac sensitization threshold (dog): 75,000 ppm.

1,1,1,2-tetrafluoroethane (HFC-134a):

Cardiac sensitization threshold (dog): 80,000 ppm.

Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Irritating to eyes and skin.

Rapid evaporation of the liquid may cause frostbite.

Avoid skin contact with leaking liquid (danger of frostbite).

Exposure to high concentrations may lead to cardiac irregularities, unconsciousness or death.

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**12. ECOLOGICAL INFORMATION**

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**ADDITIONAL ECOLOGICAL INFORMATION:**

Accumulation in aquatic organisms is unlikely.

This product contains greenhouse gases which may contribute to global warming. Do NOT vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.

This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.

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**13. DISPOSAL CONSIDERATIONS**

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**WASTE INFORMATION:**

Avoid contact of spilled material and runoff with soil and surface waterways. Consult an environmental professional to determine if local, regional or national regulations would classify spilled or contaminated materials as hazardous waste. Use only approved transporters, recyclers, treatment, storage or disposal facilities. Dispose of according to all federal, state and local applicable regulations.

**OTHER DISPOSAL CONSIDERATIONS:**

Observe all Federal, State, and Local Environmental regulations. 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.

**ADDITIONAL ADVICE:**

This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

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**14. TRANSPORT INFORMATION**

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<b>DOT</b>	Proper shipping name	: LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, n-Butane)
	UN/ID No.	: 3163
	Class	: 2.2
	Labeling	: 2.2
	Packing group	:
<b>IATA</b>	UN/ID No.	: 3163
	Description of the goods	: LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, n-Butane)
	Class	: 2.2
	Labeling	: 2.2 NON-FLAMMABLE GAS
	Packing instruction (cargo aircraft)	: 200 - Quantity: 150 kg
	Packing instruction (passenger aircraft)	: 200- Quantity: 75 kg
<b>IMDG</b>	UN/ID No.	: 3163
	Description of the goods	: LIQUEFIED GAS, N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, n-Butane)
	Class	: 2.2
	Labeling	: 2.2
	EmS codes	: F-C, S-V
<b>Other transport information</b>		: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured and: - Cylinder valve is closed and not leaking - Valve outlet cap nut or plug (where provided) is correctly fitted - Valve protection device (where provided) is correctly fitted - There is adequate ventilation. - Compliance with applicable regulations.



**15. REGULATORY INFORMATION**

**INVENTORIES**

US. Toxic Substances Control Act : On TSCA Inventory

**Canada.** Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL). (Can. Gaz. Part II, Vol. 133) : All components of this product are on the Canadian DSL list.

**NATIONAL REGULATORY INFORMATION**

SARA 313 Regulated Chemicals : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

CERCLA Reportable Quantity : 2,886 lbs  
Based on the percentage composition of this chemical in the product: Butane

California Prop. 65 : This product does not contain any chemicals known to State of California to cause cancer, birth, or any other reproductive defects.

PA Right to Know Regulated Chemical(s) : Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Butane

NJ Right to Know Regulated Chemical(s) : Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): Butane

Ozone depletion potential (ODP) : 0

**16. OTHER INFORMATION**

	<b>Health Hazard</b>	<b>Flammability</b>	<b>Physical Hazard</b>	<b>Instability</b>
<b>HMIS Classification</b>	1	0	1	



## MSDS R-417A

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