



MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY INFORMATION

PRODUCT NAME: Refrigerant R-245fa
OTHER/GENERIC NAMES: Genetron®245fa; HFC-R245fa
PRODUCT USE: Refrigerant
EXIM TRADING LLC 12601 NW 115TH 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

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
1,1,1,3,3-Pentafluoropropane	460-73-1	100.0

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: Weak

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.

4. FIRST AID MEASURES

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.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Gas, not applicable per DOT regulations
IGNITION TEMPERATURE:	412°C (774°F)
FLASH POINT METHOD:	Not applicable
UPPER EXPLOSION LIMIT):	None
LOWER EXPLOSION FLAME LIMIT:	None
FLAME PROPAGATION RATE (solids):	Not applicable
OSHA FLAMMABILITY CLASS:	Not applicable

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 fluoride	Carbon monoxide (CO)
Carbon dioxide (CO ₂)	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.

6. ACCIDENTAL RELEASE MEASURES

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.

7. HANDLING AND STORAGE

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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEEL TWA</u>
1,1,1,3,3-Pentafluoropropane	460-73-1	300 ppm 1,644 mg/m ³

9. PHYSICAL AND CHEMICAL PROPERTIES

- FORM** : Liquefied gas
- APPEARANCE** : Clear, colorless vapor
- MOLECULAR WEIGHT** : 134.03 g/mol
- PHYSICAL STATE** : Gas at ambient temperatures
- ODOR** : Weak
- Ph** : Neutral
- BOILING POINT** : 15.3 °C (59.5 °F)
- VAPOR PRESSURE** : 1,227 hPa
at 20 °C (68 °F)
- VAPOR PRESSURE** : 3,882 hPa
at 54.4 °C (129.9 °F)
- VAPOR DENSITY (air = 1.0)** : 4.6
- DENSITY** : 1.32 g/cm³
at 20 °C (68 °F)
- WATER SOLUBILITY** : 7.18 g/l



PARTITION COEFFICIENT : log Pow: 1.35
n-octanol/water : The product is more soluble in Octanol.

SOLUBILITY IN OTHER : Medium: Methanol partly soluble
SOLVENTS : Medium: Diethylether partly soluble

10. STABILITY AND REACTIVITY

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:

- Strong Acids and Strong Bases
- Potassium
- Zinc
- Strong Oxidizing Agents
- Finely divided Aluminum
- Calcium
- Barium
- Sodium
- Magnesium
- Lithium

HAZARDOUS DECOMPOSITION PRODUCTS:

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

- Gaseous hydrogen fluoride (HF)
- Carbon monoxide (CO)
- Carbonyl halides
- Carbon dioxide (CO₂)

THERMAL DECOMPOSITION: >250°C

HAZARDOUS POLYMERIZATION:

Will not occur. Stable under normal conditions

11. TOXICOLOGICAL INFORMATION

Acute Dermal Toxicity : LD₅₀ rabbit Dose: > 2,000 mg/kg

Acute Inhalation Toxicity : LC₅₀ : 4 hr. (rat) > 200,000 ppm
No deaths
Evidence of transient anesthetic effect.

Acute Inhalation Toxicity : LC₅₀ : 4 hr. (mouse) > 100,000 ppm
No deaths
Evidence of transient under activity during exposure.

Sensitization : Cardiac sensitization dogs
No effects noted at 35,000 ppm, the threshold for induction of cardiac arrhythmias in the presence of injected adrenalin

- was 44,000 ppm.
no data available
- Repeated Dose Toxicity** : rat Not a teratogen
NOEL: 50,000 ppm
Embryotoxicity
- Repeated Dose Toxicity** : rat (pups)
NOEL: 50,000 ppm
- Repeated Dose Toxicity** : rat (dams) due to decrease in body weight gains at 10,000 ppm and 50,000 ppm
NOEL: 2,000 ppm
- Repeated Dose Toxicity** : rat Exposures 6 hrs/day, 7 days/wk at 0 (control), 2,000, 10,000 and 50,000 ppm.
2 Generation Inhalation Toxicity
- Repeated Dose Toxicity** : rat (dams) Toxicity seen in dams at 10,000 and 50,000 ppm and in pups at 50,000 ppm., Increased mortality late in the lactation phase of the study.
- Repeated Dose Toxicity** : rat 28-day Inhalation Study, NOAEL (No observed adverse effect level) - 50,000 ppm, NOEL - 500 ppm, Dose levels: 0; 500; 2,000; 10,000 and 50,000 ppm
- Repeated Dose Toxicity** : rat 90-day Inhalation Study, Dose levels: 0; 500; 2,000; 10,000 and 50,000 ppm, NOAEL (No observed adverse effect level) - 2,000 ppm
- Repeated Dose Toxicity** : Overall, subchronic studies showed dose-related increases in urinary fluoride levels, urine volumes and water consumption.
Increases were noted in hematological parameters, BUN levels and serum liver enzyme activities (GOT, GPT). These increases did not follow a dose response; however, they indicate that HFC-245fa is metabolized in the liver. Significant recovery was noted in these parameters following a 2-week, non-exposure period which followed the 28-day exposure period. No histopathological effects were noted in the 28-day study. The 90-day study noted an increase in incidence and severity (trace to moderate) of myocarditis (inflammation of the heart muscle) at 10,000 and 50,000 ppm. This was not noted at the 500 or 2,000 ppm dose levels nor was it seen the 28-day study at 50,000 ppm.
- Genotoxicity in vitro** : Human lymphocytes
Weak positive activation without S9 at 30% v/v; not active with S9 up to 70% v/v.
- Genotoxicity in vitro** : Ames test with or without metabolic activation negative
- Genotoxicity in vivo** : Species: mouse
Cell type: Bone marrow

Route of exposure: Inhalation
Mutagenicity (micronucleus test) negative

12. ECOLOGICAL INFORMATION

- Toxicity to fish** : EC₅₀ Oncorhynchus mykiss (rainbow trout)
Dose: > 81.8 mg/l
Exposure time: 96 h
- Toxicity to fish** : NOEC
Species: Oncorhynchus mykiss (rainbow trout)
Dose: > 10 mg/l
Exposure time: 96 h
- Toxicity to daphnia and other aquatic invertebrates** : EC₅₀ Species: Daphnia
Dose: > 97.9 mg/l
Exposure time: 48 h
- Toxicity to daphnia and other aquatic invertebrates** : NOEC Species: Daphnia magna (Water flea)
Dose: > 97.9 mg/l
Exposure time: 48 h
- Toxicity to algae** : Growth inhibition EC₅₀
Species: Algae
Dose: > 118 mg/l
OECD Test Guideline 201
- Additional ecological information** : This product is subject to U.S. Environmental Protection Agency Clean Air Act Regulations at 40 CFR Part 82.
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.
Refer to sections 610 and 612 for list of acceptable and unacceptable uses for this product.

13. DISPOSAL CONSIDERATIONS

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.

14. TRANSPORT INFORMATION

DOT	Not dangerous goods	
TDG	Not dangerous goods	
IATA	UN/ID No.	: 3163
	Description of the goods	: LIQUEFIED GAS, N.O.S. (1,1,1,3,3-Pentafluoropropane)
	Class	: 2.2
	Hazard Labels	: 2.2
	Packing instruction (cargo aircraft)	: 200
	Packing instruction (passenger aircraft)	: 200
IMDG	UN/ID No.	: UN 3163
	Description of the goods	: LIQUEFIED GAS, N.O.S. (1,1,1,3,3-Pentafluoropropane)
	Class	: 2.2
	Hazard Labels	: 2.2
	EmS Number	: F-C
	Marine pollutant	: No

15. REGULATORY INFORMATION

INVENTORIES

1907/2006 (EU)	:	This mixture contains only ingredients which have been registered according to Regulation (EC) No. 1907/2006 (REACH).
US. Toxic Substances Control Act	:	On TSCA Inventory
Australia. AICS	:	On or in compliance with the 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.
Japan. Kashin-Hou Law List	:	On or in compliance with the inventory
Korea. Toxic Chemical Control Law (TCCL) List	:	On or in compliance with the inventory
Philippines. The Toxic	:	On or in compliance with the inventory



Substances and Hazardous and Nuclear Waste Control Act : 1,1,1,3,3-Pentafluoropropane 460-73-1

China. Inventory of Existing Chemical Substances : On or in compliance with the inventory

NZIOC - New Zealand : On the inventory, or in compliance with the inventory

NATIONAL REGULATORY INFORMATION

SARA 311/312 Hazards : Acute Health Hazard
Sudden Release of Pressure Hazard

California Prop. 65 : WARNING! This product contains a chemical known to the State of California to cause cancer.
Dichloromethane 75-09-2

Massachusetts RTK : Dichloromethane 75-09-2

Pennsylvania RTK : Dichloromethane 75-09-2

WHMIS Classification A
This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR

Global warming potential : 950

Ozone depletion potential (ODP) : 0

16. OTHER INFORMATION

	Health Hazard	Flammability	Physical Hazard	Instability
HMIS III Classification	2	1	0	
NFPA Classification	2	1		0

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MSDS R-245fa

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