

SAFETY DATA SHEET

FROSTBERG® R-407C



SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product name FROSTBERG® R-407C
Product Use Description Refrigerant
Company FROSTBERG INTERNATIONAL LLC
16192 Coastal Highway Lewes,
Dalawere 19958 USA.
For More Information www.frostbergint.com

SECTION 2: HAZARDS IDENTIFICATION

Form Liquefied gas
Color Colorless
Odor Slight
Classification Gases under pressure – Liquefied gas.

Label Elements

Symbol



Signal Word Warning
Hazard Statement Contains gas under pressure; may explode if heated.
Precautionary Statements Protect from sunlight. Store in a well-ventilated place.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

Concentration

Substance Name	CAS No.	EC No.	Concentration
1,1,1,2-Tetrafluoroethane	811-97-2	212-377-0	52%
Pentafluoroethane	354-33-6	206-557-8	25%
Difluoromethane	75-10-5	200-839-4	23%

SAFETY DATA SHEET

FROSTBERG® R-407C



Hazardous components according to Regulation (EC) 1272/2008 as amended

Substance name	Hazard Class	Hazard Category	H Phrases
1,1,1,2-Tetrafluoroethane	Gases under pressure	Liquefied gas	H 280
Pentafluoroethane	Gases under pressure	Liquefied gas	H 280
Difluoromethane	Flammable gases	Category 1	H 280
	Gases under pressure	Liquefied gas	H 280

Hazardous components according to European Directive 67/548/EEC or 1999/45/EC as amended

Substance Name	Classification	Hazard Category	H Phrases
Difluoromethane	F+	Extremely flammable	R12

SECTION 4: FIRST AID MEASURES

Inhalation	Remove to fresh air. Oxygen or artificial respiration if needed. If symptoms persist, call the physician.
Skin Contact	After contact with skin, wash immediately with plenty of water. 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. If symptoms persist, call a physician.
Eye Contact	Immediately irrigate with eyewash solution or clean water, holding the eyelids apart for at least 10 minutes. Obtain immediate medical attention.
Ingestion	Unlikely Route of exposure
Treatment	Because of the possible disturbance 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 frost-bitten areas as needed.

SECTION 5: FIRE-FIGHTING MEASURE

Extinguishing Media

Suitable Extinguishing Media	As appropriate for surrounding fire. Keep fire exposed containers cool by spraying with water.
------------------------------	--

SAFETY DATA SHEET

FROSTBERG® R-407C



Unsuitable Extinguishing Media	None.
Specific Hazard Arising From The Chemical	The product is not flammable. Hazardous decomposition products formed under fire conditions.
Special Protective Actions For Fire-Fighters	Wear self-contained breathing apparatus and protective suit. Wear chemical resistant over suit. Special protective actions for fire-fighters. In case of fire, use water spray. Keep product and empty container away from heat and sources of ignition.

SECTION 6: ACCIDENTAL RELEASE MEASURE

Personal Precautions	Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Wear personal protective equipment. Unprotected persons must be kept away. Remove all source of ignition. Avoid skin contact with leaking liquid (danger of frostbite). Ventilate the area. 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 $\geq 19.5\%$
Environmental Precautions	Prevent further leakage or spillage if safe to do so.
Methods For Cleaning Up	The product evaporates readily. Ventilate the area. Prevent product from entering drains.

SECTION 7: HANDLING AND STORAGE

Handling	Use only in well-ventilated areas. Use only clean and dry utensils. Keep away from water. Preferably transfer by pump or gravity. Keep away from incompatible products.
----------	---

SAFETY DATA SHEET

FROSTBERG® R-407C



Storage Keep only in the original container.
 Store in a reachable equipped with a vent.
 Keep containers tightly closed in a cool, well-ventilated place.
 Keep in properly labelled containers.
 Protect cylinders from physical damage. Away from heat/ sparks/ open flames/ hot surfaces.

Packing Material Suitable material – steel cylinder

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

Control Parameters Guidelines

Substance name	Acceptable exposure limit	EH40 workplace exposure limits
1,1,1,2-Tetrafluoroethane	TWA = 1000 ppm	TWA = 1000 ppm / 4240 mg/m ³
Pentafluoroethane	TWA = 1000 ppm	-----
Difluoromethane	TWA = 1000 ppm	-----

Exposure Controls

Appropriate Engineering Controls Ensure adequate ventilation.
 Apply technical measures to comply with the occupational exposure limits.

Respiratory Protection Self-contained breathing apparatus (EN 133).
 Wear self-contained breathing apparatus in confined spaces, in cases where the oxygen level is depleted, or in case of significant emissions.
 Use only respiratory protection that conforms to international / national standards.

Hand Protection Take note of the information given by the producer concerning permeability and break through times and of special workplace conditions (mechanical strain, duration of contact).
 Protective gloves.
 Suitable material: Fluoroelastomer.

Eye Protection Tightly fitted safety goggles.

SAFETY DATA SHEET

FROSTBERG® R-407C



Skin And Body Protection	Wear suitable protective clothing. If splashes are likely to occur, wear: apron, boots, Neoprene.
Hygiene Measures	Eye wash bottles or eye wash stations in compliance with applicable standards. When using do not eat, drink or smoke. Gloves, overalls and boots have to be doubled layered (protection against cold temperature). Handle in accordance with good industrial hygiene and safety practice.
Environmental Controls	Exposure Dispose of rinse water in accordance with local and national regulations.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquefied gas
Color	Colorless
Odor	Slight
pH	Neutral
Melting/Freezing Point	-103°C (Pentafluoroethane)
Boiling Point/Boiling Range	-44 to -37°C
Flash Point	N/A
Evaporation Rate	>1
Explosive Properties	Not Explosive
Vapor Pressure	10,769 hPa at 21.1°C 24,593 hPa at 54.4°C
Vapor Density	3.45
Density	1.16 g/cm ³ at 21.1 °C
Relative Density	1.17 at 20°C
Water Solubility	430 mg/l at 25°C
Partition Coefficient: n-octanol/water	log Pow: 1.48, 20°C
Auto Ignition Temperature	N/A
Decomposition Temperature	N/A

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Risk of violent reaction.
Chemical Stability	Stable under recommended storage conditions.

SAFETY DATA SHEET

FROSTBERG® R-407C



Possibility of reactions	hazardous	Strong oxidizers, alkali metals and alkaline earth metals may cause fires or explosions.
Conditions To Avoid		Heat
Material To Avoid		Light and/or alkaline metals, powdered metals, alkaline earth metals, oxidizing agents.
Hazardous Products	Decomposition	Gaseous hydrogen fluoride (HF), Fluorophosgene. The release of other hazardous decomposition products is possible.

SECTION 11: TOXICOLOGICAL INFORMATION

Acute Toxicity

Acute Oral Toxicity		N/A
Acute Inhalation Toxicity		LC50, 4 h, >2,080,000 mg/m ³ (1,1,1,2-Tetrafluoroethane)
Acute Dermal Toxicity		N/A

Skin Corrosion/Irritation N/A

Serious Eye Damage/Eye Irritation N/A

Respiratory Or Skin Guinea pig, did not cause sensitization on laboratory animals

Sensitization

Mutagenicity In vitro tests did not show mutagenic effects (Pentafluoroethane).
In vivo tests did not show mutagenic effects (Pentafluoroethane).

Carcinogenicity Negative (1,1,1,2-Tetrafluoroethane).

Toxicity For Reproduction Developed toxicity, rat, no observed effect (1,1,1,2-Tetrafluoroethane).

Repeated Dose Toxicity Inhalation, after a single exposure, dog, cardiac sensitization following adrenergic stimulation.

Inhalation, rat, >=5000ppm, NOAEL (1,1,1,2-Tetrafluoroethane).

Inhalation, repeated exposure, rat, >=5000ppm, NOAEL (Pentafluoroethane).

Inhalation, 90-day, rat, 108mg/m³, NOAEL (Difluoromethane)

Other Information No data available.

SAFETY DATA SHEET

FROSTBERG® R-407C



SECTION 12: ECOLOGICAL INFORMATION

Eco Toxicity Effects

Toxicity To Daphnia And Other Aquatic Invertebrates No data available

Biodegradability:

Result: Not readily biodegradable.

Pentafluoroethane

Value: 5%

Method: OECD 301 D

Difluoromethane

Note: Minimal

Further Information On Ecology

Additional Ecological Information This product is subjected to U.S. Environment 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 atmosphere.

To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Methods

In accordance with local and national regulations.

Refer to manufacture/supplier for information on recovery/recycling.

Contaminated Packaging

To avoid treatments, as far as possible, use dedicated containers. Where possible recycling is preferred to disposal or incineration.

SECTION 14: TRANSPORT INFORMATION

DOT	UN/ID No.	UN 3340
	Proper Shipping Name	REFRIGERANT GAS R 407C
	Class	2.2
	Packing Group	
	Hazard Labels	2.2

IATA	UN/ID No.	UN 3340
	Description Of Goods	REFRIGERANT GAS R 407C
	Class	2.2
	Hazard Labels	2.2

SAFETY DATA SHEET

FROSTBERG® R-407C



	Packing Instruction (Cargo Aircraft)	200
	Packing Instruction (Passenger Aircraft)	200
IMDG	UN/ID No.	UN 3340
	Proper Shipping Name	REFRIGERANT GAS R 407C
	Class	2.2
	Hazard Labels	2.2
	Ems Number	F – C, S – V
	Marine Pollutant	No

SECTION 15: REGULATORY INFORMATION

Inventories

US. Toxic Substances Control Act On TSCA Inventory.

Australia: Industrial Chemical (Notification And Assessment) Act On the inventory, or in compliance with the inventory.

Canada: Canadian Environmental Protection Act (CEPA). Domestic Substances List. All components of this product are on the Canadian DSL.

Japan: Kashin-Hou Law List On the inventory, or in compliance with the inventory.

Korea: Toxic Chemical Control Law (TCCL) List On the inventory, or in compliance with the inventory.

Philippines: The Toxic Substances And Hazardous And Nuclear Waste Control Act On the inventory, or in compliance with the inventory.

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

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

National Regulatory Information

SARA 302 Components: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302

SAFETY DATA SHEET

FROSTBERG® R-407C



SARA 313 Components:	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	
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
	WARNING! This product contains a chemical known to the state of California to cause birth defects or other reproductive harm. Chloromethane	74-87-3
Massachusetts RTK	Dichloromethane	75-09-2
New Jersey RTK	Dichloromethane	75-10-5
Pennsylvania RTK	Dichloromethane	75-10-5
WHMIS Classification	Compressed Gas: This product has been classified according to the hazard criteria of the CPR and the SDS contains all of the information required by the CPR.	
Global Warming Potential	1,653	
Ozone Depletion Potential	0	