

SAFETY DATA SHEET



FROSTBERG®

R-1234yf

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Product Name : R1234YF

MSDS Number : 0000201234yf

Chemical Family : C3H2F4

Product Use Description : Refrigerant Gas

Company : FROSTBERG INTERNATIONAL LLC

16192 Coastal Highway Lewes, Delaware 19958, USA

For More Information : [www.frostbergint.com](http://www.frostbergint.com)

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Nature

| CHEMICAL NAME      | CAS – NO | CONCENTRATION |
|--------------------|----------|---------------|
| TETRAFLUOROPROPENE | 754-12-1 | 100 %         |

SECTION 3: HAZARD IDENTIFICATION

CLASSIFICATION : Flammable Gas, Gas under pressure, Compressed Gas, may explode if heated.

SIGNAL WORD : DANGER

HAZARD STATEMENT(S) : Extremely flammable gas, Contains gas under pressure, may explode if heated

SYMBOL(S) : Flames, Gas Cylinder

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Symbol(s)

:



## PRECAUTIONARY STATEMENT(S):

- Prevention : Keep away from heat, sparks, open flame, and hot surfaces. No Smoking
- Response : Leaking gas fire: Do not extinguish unless leak can be stopped immediately.  
Eliminate all ignition sources if safe to do so.
- Storage : Protect from sunlight, store in a well-ventilated place.
- EMERGENCY OVERVIEW : Flammable gas. Liquid under high pressure.

## POTENTIAL HEALTH EFFECTS

- Effects of Overexposure : Eye Contact Liquid can cause severe irritation, redness, tearing, blurred vision, and possible freeze burns.
- Skin Contact : Contact with evaporating liquid can cause frostbite.
- Inhalation : Inhalation of vapor may produce anesthetic effects and feeling of euphoria. Prolonged overexposure can cause rapid breathing, headache, dizziness, narcosis, unconsciousness, and death from asphyxiation, depending on concentration and time of exposure.
- Ingestion : Avoid giving milk or oils  
Avoid giving alcohol.

## SECTION 4: FIRST AID MEASURES

- SKIN : For liquid contact, warm areas gradually and get medical attention if there is evidence of tissue damage. Flush area with plenty of water.
- EYES : For liquid contact, irrigate with running water for minimum of 15 minutes. Consult physician immediately if frostbite occurs

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|---------------------|---------------------------------------------------------------------------------------------------------------------|
| INHALATION          | : Remove to fresh air. If breathing has stopped, restore breathing at once. Administer oxygen and get medical help. |
| INGESTION           | : Do not induce vomiting. Contact a physician immediately.                                                          |
| ADVICE TO PHYSICIAN | : No special instructions                                                                                           |

## SECTION 5: FIREFIGHTING MEASURES

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                             |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FLASH POINT (METHOD)     | : Not applicable.<br>Autoflammability°C: 405                                                                                                                                                                                                                                                                                                                                                                                |
| UPPER EXPLOSIVE LIMIT %  | : 12.3 (21 C)                                                                                                                                                                                                                                                                                                                                                                                                               |
| LOWER EXPLOSIVE LIMIT %  | : 6.2 (21 C)                                                                                                                                                                                                                                                                                                                                                                                                                |
| EXTINGUISHING MEDIA      | : Dry chemical, CO2 or water spray to extinguish gas.                                                                                                                                                                                                                                                                                                                                                                       |
| UNUSUAL FIRE HAZARDS     | : Vapors are heavier than air and may travel along the ground or may be moved by ventilation systems and ignited by pilot lights, other flames, sparks, heaters, smoking, electric motors, static discharge, or other ignition sources at locations distant from material handling point.                                                                                                                                   |
| FIRE FIGHTING PROCEDURES | :                                                                                                                                                                                                                                                                                                                                                                                                                           |
| FOR SMALL FIRE:          | Dry chemical, CO2 or water spray to extinguish gas.<br><br>Stop the release of materials if possible. Cool the vapor space of the storage container with water spray. Avoid accumulation of unburned materials. Remove personnel in general area. Observe maximum isolation when extinguishing fire. Expansion of liquid and change of state from liquid to vapor will allow combustible mixture to encompass a large area. |

## SECTION 6: ACCIDENTAL RELEASE MEASURES

### STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Avoid sources of ignition-Ventilate area. Use water fog to evaporate or ventilate. Protect body against contact with liquid. If confined space – Use self-contained breathing apparatus. Consult local fire authorities.

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## SECTION 7: HANDLING AND STORAGE HANDLING

- NORMAL HANDLING : Comply with state and local regulations covering flammable gases.
- STORAGE RECCOMENDATIONS : Store small containers in well-ventilated areas, away from heat or sources of ignition. Prohibit smoking in areas of storage or use.

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### VENTILATION

- Mechanical : Provide as needed to keep concentration in air below TLV and LEL Local
- Exhaust : Continuous ventilation recommended
- Special : Explosion proof fans and motors
- SKIN PROTECTION : Impervious, insulated gloves recommended. Impervious clothing for prolonged or repeated contact
- EYE PROTECTION : Face shield or goggles recommended
- RESPIRATORY PROTECTION : NIOSH approved self-contained breathing apparatus in confined areas

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

- APPEARANCE : Colorless, liquefied compressed gas
- PHYSICAL STATE : Gas at ambient temperature
- ODOR : Characteristic odour
- SOLUBILITY IN WATER : 198.2 mg/l at 24 deg. C.
- BOILING POINT : -29.4 C.
- VAPOR PRESSURE : 6.826 Bar @ 25degC

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|                           |                                                                                   |
|---------------------------|-----------------------------------------------------------------------------------|
| FLASHPOINT                | : Not applicable.                                                                 |
| EVAPORATION RATE          | : No data available.                                                              |
| FLAMMABILITY              | : Extremely flammable in the presence of ignition sources or oxidizing materials. |
| AUTO IGNITION TEMPERATURE | : 405C                                                                            |
| DECOMPOSITION TEMPERATURE | : Data not available                                                              |
| VISCOSITY                 | : Not applicable                                                                  |
| Ph                        | : Not applicable                                                                  |
| MOLECULAR FORMULA         | : C3H2F4                                                                          |

## Section 10: STABILITY AND REACTIVITY

|                    |                                                 |
|--------------------|-------------------------------------------------|
| CHEMICAL STABILITY | : The product is stable.                        |
| REACTIVITY         | : Not reactive under normal storage conditions. |

## SECTION 11: TOXICOLOGICAL INFORMATION

**Rat inhalation LC50 (4 hr.): 658,000ppm**

### POTENTIAL HEALTH EFFECTS

Effects of Overexposure:

|              |                                                                                                                                                                                                                                                                                           |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eye Contact  | : Eye contact with the rapidly evaporation liquid may cause frostbite.                                                                                                                                                                                                                    |
| Skin Contact | : Skin contact with the rapidly evaporation liquid may cause frostbite. Frostbite effects are a change in color of the skin to gray or white, followed by blistering.                                                                                                                     |
| Inhalation   | : Vapor is heavier than air and can cause suffocation by reducing oxygen available for breathing. Inhalation of high vapor concentration may cause dizziness, disorientation, incoordination, narcosis, nausea or vomiting, leading to unconsciousness, cardiac irregularities, or death. |
| Ingestion    | :Not an expected route of exposure.                                                                                                                                                                                                                                                       |

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DELAYED AND IMMEDIATE EFFECTS : No known significant effects or critical hazards

CARCINOGEN : Not listed by NTP, IARC, or NIOSH

## SECTION 12: ECOLOGICAL INFORMATION

DEGRADABILITY (BOD): No data given

## SECTION 13: DISPOSAL CONSIDERATIONS

- (1) Mechanical recovery
- (2) Flare-Off at safe location (Vapors)
- (3) Exhaust to atmosphere in safe location (No open flames)

OTHER DISPOSAL CONSIDERATIONS : Disposal must comply with federal, state, and local disposal laws.

## SECTION 14: TRANSPORT INFORMATION

US DOT ID NUMBER : 3161

US DOT SHIPPING NAME : LIQUEFIED GAS, FLAMMABLE, N.O.S. (contains 2,3,3,3-tetrafluoropropene)

US DOT HAZARD CLASS : 2.1

US DOT PACKING GROUP : NA

## SECTION 15: REGULATORY INFORMATION

The ingredients listed in section 2 are reported/included in the U.S. TSCA inventory and Canadian domestic substance list. The product is defined by OSHA in 29 CFR 1910.1200c as a flammable gas. Use of this product may require compliance with 29 CFR 1910.119, process safety management of highly hazardous chemicals.

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## SECTION 16: OTHER INFORMATION

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 4, Reactivity – 1

### Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

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