Revised date 01.08.2024

MATERIAL SAFETY DATA SHEET
HFO 1234YF

CHEMICAL PRODUCT

Corporate MSDS Number	: TAB-005001
Composition	: HFO1234yf (100.0%)
Formula	: $C_3H_2F_4$
Chemical Name	: 2,3,3,3-tetrafluoro-1-propene
CAS#	: 754-12-1
UN#	: 3161
HS Code	: 290351
Hazard	: 2.1

COMPANY IDENTIFICATION

TABRIGAS Egypt
Port Said Free Zone area – Egypt
Sunday – Thursday (9:00 – 17:00)
00 202 2734 22 77 / 78 / 79
info@tabrigas.com
www.tabrigas.com

PRODUCT USE

Refrigerant

TRADE NAMES & SYNONYMS

2,3,3,3-tetrafluoro-1-propene
HFO-1234yf

HAZARDS IDENTIFICATION

Potential Health Effects

Inhalation of high concentrations of vapor is harmful and may cause heart irregularities, unconsciousness, or death. Intentional misuse or deliberate inhalation can be fatal. Vapors are heavier than air and pose a threat of suffocation if trapped in coordinated low places. Liquid contact can cause frostbite. Inhalation may cause dizziness, headache, confusion, incoordination, and loss of consciousness.

Immediate effects of overexposure by inhalation may include central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Gross overexposure may cause irregular heart beat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting,

dizziness, weakness, sometimes progressing to loss of consciousness and death. Other effects include fatality from gross over exposure.

Short-term overexposure by skin contact may cause frostbite, if liquid or escaping vapor contacts the skin. Repeated and/or prolonged exposure may cause defatting of the skin with itching, redness or rash. Data to evaluate the skin permeation hazard of this compound are insufficient. There are no reports of human sensitization.

Contact with the vapor or aerosol may cause eye irritation with tearing, pain or blurred vision

Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the central nervous system, cardiovascular system.

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST-AID MEASURES

Inhalation

If inhaled, immediately remove to fresh air. Keep the person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Skin Contact

In case of contact, flush the area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.

Eye Contact

In case of contact, immediately flush your eyes with plenty of water for at least 15 minutes. Call a physician.

Ingestion

Ingestion is not considered a potential route of exposure.

Notes to Physicians

THIS MATERIAL MAY MAKE THE HEART MORE SUSCEPTIBLE TO ARRHYTHMIAS. Catecholamine such as adrenaline, and other compounds having similar effects, should be reserved for emergencies and then used only with special caution.

FIRE FIGHTING MEASURES

Flammable Properties

Auto-ignition temperature	: 405 °C (761 °F) @ 1,013 hPa
Method	: Directive 67/548/EEC, Annex V, A.15.static test
Lower explosion limit/ lower flammability limit	: Type: lower flammability limit, 6.2 vol% @ 21 °C (70 °F)

Upper explosion limit/ upper flammability limit : Type: upper flammability limit, 12.3 vol% @ 21 °C (70 °F) @ 1013 hPa

Fire and Explosion Hazard: Vapors are heavier than air and may spread along floors. Vapors may form a flammable mixture with air. Fire or intense heat may cause violent rupture of packages.

Hazardous thermal decomposition products: Hydrogen fluoride Fluorinated Compounds Carbon oxides

Suitable extinguishing media : Water spray, Alcohol-resistant foam, Dry chemical, Carbon dioxide (CO2)

Firefighting Instructions : In the event of fire, wear a self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Evacuate personnel to safe areas. Cool containers / tanks with water spray. Fire or intense heat may cause violent rupture of packages.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Accidental Release Measures

Ventilate areas, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use a self-contained breathing apparatus (SCBA) for large spills or releases.

HANDLING AND STORAGE

Handling (Personnel)

Use sufficient ventilation to keep employee exposure below recommended limits. “HFO 1234YF, should not be mixed with air for leak testing. In general, it should not be used or allowed to be present with high concentrations of air above atmospheric pressure. Contact with chlorine or other strong oxidizing agents should also be avoided.

Storage

Clean, dry area. Do not heat above 52 ^{0}C (125 ^{0}F).

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Normal ventilation for standard manufacturing procedures is generally adequate. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

Personal Protective Equipment

Impervious gloves and chemical splash goggles should be used when handling liquid.
Under normal manufacturing conditions, no respiratory protection is required when using this product.
Self-contained breathing apparatus (SCBA) is required if a large release occurs.

Exposure Guidelines

Applicable Exposure Limits
"HFO 1234 YF, 2,3,3,3-tetrafluoroprop-1-ene

PEL (OSHA)	: None Established
TLV (ACGIH)	: 1,000 ppm, 3,540 mg/m3, 8 Hr. TWA, A4

* AEL is Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Form	: Liquefied gas
Color	: Colorless
Odor	: slight, ether-like
pH	: pH
Melting point	: -152.2 °C (-242.0 °F)
Boiling Point	: -29.4 °C (-20.9 °F)
Vapor Pressure	: 5,830 hPa @ 20 °C (68 °F)
Density	: 0.0048 g/cm3 at 20 °C (68 °F) @ (1,013 hPa) Vapor density
Water solubility	: 0.1982 g/l @ 24 °C (75 °F)
Partition coefficient	: nocturnal/water:
POW	: 2 @ 25 °C (77 °F)
Method	: High-performance liquid chromatography
Vapor density	: 4 (Air = 1.0)

STABILITY AND REACTIVITY

Chemical Stability

Material is stable. However, avoid open flames and high temperatures.

Incompatibility with Other Materials

Incompatible with alkali or alkaline earth metals - powdered Al, Zn, Be, etc.

Decomposition

Decomposition products are hazardous.HFO-1234YF can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrochloric and hydrofluoric acids, and possibly carbonyl halides. These

materials are toxic and irritating. Contact should be avoided.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

INHALATION:

4 hours, LC50, rat: 220,000 ppm.
Inhalation 4 hour, LC50, rat: 220,000 ppm
Animal testing indicates this material is a slight eye irritant.
Animal testing indicates this material is a skin irritant, but not a skin sensitizer.
Long-term exposure by ingestion caused no significant toxicological effects.
Single inhalation exposure to high doses caused central nerve depression. inactivity or anesthesia, lung noise, altered respiratory rate, histopathological changes of the liver, cardiac sensitization, potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action o epinephrine. Repeated exposure caused no significant toxicological effects. Long-term exposure caused reduced weight gain, increased adrenals, kidney, liver, and pituitary weight.

In chronic inhalation studies HFO1234YF, at a concentration of 50,000 ppm (v/v), produced a small, but statistically significant increase of late-occurring tumors involving salivary glands in male rats, but not female rats or male or female mice. In the same studies, no increased incidence of tumors was seen in either species at concentrations of 10,000 ppm or 1000 ppm (v/v). Animal data show developmental effects only at exposure levels producing other toxic effects in the adult animal. This material is not considered a unique developmental hazard to the concepts. Reproductive data on male animals show no change in reproductive performance. Specific studies to evaluate the effect on female reproductive performance have not been conducted; however, limited information obtained from studies on developmental toxicity do not indicate adverse effects on female reproductive performance. This material produces genetic damage in bacterial cell cultures. In mammalian cell cultures and animals, this material has not produced genetic toxicity. In animal testing, this material has not caused permanent genetic damage in the reproductive cells of mammals (has not produced heritable genetic damage).

ECOLOGICAL INFORMATION

Eco toxicological Information

Aquatic Toxicity:
HFO 1234 YF
48-hour EC50 - Daphnia magna: 433 mg/L

DISPOSAL CONSIDERATIONS

Waste Disposal

Comply with Federal, State, and local regulations. Reclaim by distillation or remove to a permitted waste disposal facility.

TRANSPORTATION INFORMATION

Shipping Information

DOT/IMO

Proper Shipping Name	: 2,3,3,3-tetrafluoroprop-1-ene
Hazard Class	: 2.1
UN No.	: 3161
DOT/IMO Label	: NONFLAMMABLE GAS

Shipping Containers

Tank Cars.

Tank Trucks.

Cylinders.

Shipping Information - TDG

Proper Shipping Name	: 2,3,3,3-tetrafluoroprop-1-ene

REGULATORY INFORMATION

U.S. Federal Regulations

TSCA Inventory Status : Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute	: Yes
Chronic	: No
Fire	: No
Reactivity	: No
Pressure	: Yes

HAZARDOUS CHEMICAL LISTS

SARA Extremely Hazardous Substance	: No
CERCLA Hazardous Substance	: No
SARA Toxic Chemical	: - See Components Section

Canadian Regulations

CEPA Status	: Compliant.
WHMIS Classification	: CLASS A Compressed Gas

This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all the information required by the CPR.

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating

Health	: 1
Flammability	: 0
Reactivity	: 1

Personal Protection rating to be supplied by user depending on use conditions

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

End of MSDS
(Version August 2024)


150th anniversary
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