Revised date 21.01.2024

MATERIAL SAFETY DATA SHEET
HFO 448A

CHEMICAL PRODUCT

Corporate MSDS Number	: TAB-005003
Composition	: HFO 448A (100.0%)
Formula	: CH_2F_2 + CHF_2CF_3 + $C_3H_2F_4$ + CH_2FCF_3 + $C_3H_2F_4$
Chemical Name	: Difluoromethane + Pentafluoro ethane + 2,3,3,3-tetrafluoro-1-propene + 1,1,1,2-tetrafluoroethane + trans-1,3,3,3-tetrafluoro-1-propene)
CAS#	: 75-10-5 + 354-33-6 + 754-12-1 + 811-97-2 + 29118-24-9
UN#	: 3163
HS Code	: 382765
Hazard	: 2.2

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

HFO 448A
R 448A

HAZARDS IDENTIFICATION

Classification of the substance or mixture

Gases under pressure, Liquefied gas
Simple Asphyxiate

GHS Label elements, including precautionary statements

Symbol (s) Signal word Warning

Hazard statements — Contains gas under pressure; may explode if heated.
May displace oxygen and cause rapid suffocation.

Precautionary statements

Prevention:
Use personal protective equipment as required.
Storage:
Protect from sunlight. Store in a well-ventilated place.

Hazards not otherwise classified

May cause frostbite.
May cause cardiac arrhythmia.
May cause eye and skin irritation.

Carcinogenicity Information

No component 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.

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

Suitable extinguishing media

The product is not flammable.
Use water spray, alcohol-resistant foam, dry chemicals, or carbon dioxide.

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Specific hazards during firefighting

Contents under pressure.
This product is not flammable at ambient temperatures and atmospheric pressure.
However, this material can ignite when mixed with air under pressure and exposed to strong ignition sources.
The container may rupture on heating.
Cool closed containers exposed to fire with water spray.
Do not allow run-off from firefighting 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
- Carbon dioxide (CO2)
- Carbonyl halides

Special protective equipment for firefighters

In the event of fire and explosion do not breathe fumes.
Wear a self-contained breathing apparatus and protective suit.
No unprotected exposed skin areas.

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)

Handle with care.
Avoid inhalation of vapor or mist.
Do not get in the eyes, on the skin, or clothing.
Wear personal protective equipment.
Use only in well-ventilated areas.
Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C.
Follow all standard safety precautions for handling and use of compressed gas cylinders.
Use authorized cylinders only.

Protect cylinders from physical damage.
Do not puncture or drop cylinders, or expose them to open flame or excessive heat.
Do not pierce or burn, even after use. Do not spray on a naked flame or any incandescent material.
Do not remove the screw cap until immediately ready for use.
Always replace the cap after use.

STORAGE

Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Storage rooms must be properly ventilated.
Ensure adequate ventilation, especially in confined areas.
Protect cylinders from physical damage.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

General room ventilation is adequate for storage and handling.
Perform filling operations only at stations with exhaust ventilation facilities.

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

Components	CAS NO.	Value	Control parameters
Difluoromethane	75-10-5	TWA: Time weighted average	2,200 mg/m3 (1,000 ppm)
Pentafluoro ethane	354-33-6	TWA: Time weighted average	(1,000 ppm)
1,1,1,2-Tetrafluoroethane	811-97-2	TWA: Time weighted average	4,240 mg/m3 (1,000 ppm)
2,3,3,3-Tetrafluoroprop-1-ene	754-12-1	TWA: Time weighted average	(500 ppm)
trans-1,3,3,3-Tetrafluoroprop-1-ene	29118-24-9	TWA: Time weighted average	(800 ppm)

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Form	: Liquefied gas
Color	: Colorless
Odor	: slight, ether-like
pH	: Neutral
Melting point	: No data available
Boiling Point	: - 45.9 °C, at 101.3 kPa
Flash Point	: Not applicable
Vapor Pressure	: 1120 kpa @ 21.1 °C
Liquid Density	: 1.11 gram/cm3
Water solubility	: No data available
Auto ignition	: 628 °C
Decomposition temperature	: > 250 °C

STABILITY AND REACTIVITY

Chemical Stability

Stable under normal conditions.

Incompatible materials to avoid

Potassium
Calcium
Powdered metals
Finely divided aluminum
Finely divided magnesium
Zinc

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.

Polymerization

Hazardous polymerization does not occur.

TOXLOGICAL |INFORMATION

Difluoromethane	LC50: > 520000 ppm Exposure time: 4 h Species: Rat
Pentafluoroethane	> 769000 ppm Exposure time: 4 h Species: Rat
1,1,1,2-Tetrafluoroethane	LC50: > 500000 ppm Exposure time: 4 h Species: Rat
2,3,3,3-Tetrafluoroprop-1-ene	LC50: > 400000 ppm Exposure time: 4 h Species: Rat Method: OECD Test Guideline 403
trans-1,3,3,3-Tetrafluoroprop-1-ene	100000 ppm Species: Mouse Note: Acute (4-Hour) Inhalation Toxicity Screening Study (mouse): No lethality at >100,000 ppm.
	LC50: > 207000 ppm Exposure time: 4 h Species: Rat

Skin irritation

2,3,3,3-Tetrafluoroprop-1-ene	:	Note: Not applicable The study technically not feasible.
trans-1,3,3,3-Tetrafluoroprop-1-ene	:	Species: Rabbit Result: No skin irritation Method: OECD Test Guideline 404

ECOLOGICAL INFORMATION

Eco toxicological Information

Aquatic Toxicity:

HFO 1234 ZE

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	: trans-1,3,3,3-tetrafluoro-1-propene
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	: trans-1,3,3,3-tetrafluoro-1-propene

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 under 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 any process.

End of MSDS
(Version August 2024)


150th anniversary
PHARAON GROUP
since 1868
TABRIGAS®
ISO 9001 2015 CERTIFIED
Chemours™
ARKEMA
ASHRAE®
NFPA®
WORLD REFRIGERATION DAY
June 26th every year