

Refrigerant Well

R448A

Safety Data Sheet

R448A

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: R448A
OTHER NAME: difluoromethane, pentafluoroethane, 1,1,1,2-tetrafluoroethane, 2,3,3,3-tetrafluoropropene and trans-1,3,3,3-tetrafluoropropene
USE: Refrigerant Gas
DISTRIBUTOR: Troy Ave South
El Monte California 91733

FOR MORE INFORMATION CALL:

1-213-926-8212

IN CASE OF EMERGENCY CALL:

1-213-926-8212

2. HAZARDS IDENTIFICATION

CLASSIFICATION: Flammable Gas, Gas under pressure, Compressed Gas
SIGNAL WORD: DANGER
HAZARD STATEMENT(S): Extremely flammable gas, contains gas under pressure, may explode if heated
SYMBOL(S): Flames, Gas Cylinder



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

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

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grey 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.

OTHER EFFECTS OF OVEREXPOSURE: None Expected.

3. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENT NAME</u>	<u>CAS NUMBER</u>	<u>WEIGHT %</u>
1,1-Difluoromethane	75-10-5	26
2,3,3,3-Tetrafluoroprop-1-EN	754-12-1	20
Pentafluoroethane	354-33-6	26
trans-1,3,3,3-Tetrafluoropropene	29118-24-9	7
1,1,1,2-Tetrafluoroethane	811-97-2	21

COMMON NAME and SYNONYMS

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There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2

4. FIRST AID MEASURES

SKIN:

Immediately wash with plenty of warm water (do not rub). Thaw affected area with water. Remove contaminated clothing. Caution: clothing may adhere to the skin in case of freeze burns. If symptoms (irritation or blistering) develop, get medical attention.

EYES:

Immediately flush with plenty of water. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Hold eyelids open during flushing. Have eyes examined and treated by medical personnel.

INHALATION:

Move victim to fresh air. Keep warm and at rest. If breathing is labored, give oxygen. If only breathing has stopped, give artificial respiration with a pocket mask equipped with a on-way valve to prevent exposure to product or body fluids. If breathing has stopped and there is no pulse, give cardiopulmonary resuscitation (CPR). Get immediate medical attention.

INGESTION:

Highly unlikely, but should this occur, freeze burns will result. Do not induce vomiting unless instructed to do so by a physician.

ADVICE TO PHYSICIAN:

Symptomatic and supportive therapy, as indicated. Administration of epinephrine or similar sympathomimetic drugs should be with special caution and only in situations of emergency life support as cardiac arrhythmias may result.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT:	Not applicable
AUTOIGNITION TEMPERATURE:	Not applicable
UPPER FLAME LIMIT:	Not applicable
LOWER FLAME LIMIT:	Not applicable

HAZARDOUS REACTIONS:

Reacts with finely divided metals such as aluminum, zinc, magnesium, and alloys containing more the 2% magnesium. Can react violently if in contact with alkali metals and alkaline earth metals such as sodium, potassium, or barium.

During a fire the product can form toxic and corrosive gases such as hydrogen fluoride.

EXTINGUISHING MEDIA:

Suitable extinguishing medium is dry powder. Allow escaping gas to urn under controlled conditions. Extinguish only if escape of gas can be rapidly stopped as it may form a flammable vapor cloud.

FIRE AND EXPLOSION HAZARDS:

Flammable liquefied gas. Container may burst under intense heat. Ruptured cylinders may rocket or fragment. Heavy vapor may suffocate.

FIRE FIGHTING PROCEDURES:

Water spray should be used to cool containers.

FIRE FIGHTING PROTECTIVE EQUIPMENT:

Use self-contained breathing apparatus with a full-face piece and special protective clothing.

6. ACCIDENTAL RELEASE MEASURES

This product is a flammable, liquefied gas, which exits the container at temperatures capable of causing freeze burns (frostbite). Contents under pressure. Ruptured cylinder may rocket or fragment.

Precautions should take into account the severity of the leak or spill.

Move unprotected personnel upwind of leaking container. Remove ignition sources and ventilate the spill area. Use recommended personal protection and shut off the leak, if without risk. If possible, elevate leak position to highest point of container (should leak gas, not liquid). Water should never be put on leak nor should cylinder be immersed. If possible, dike and contain spillage. Prevent liquid from entering sewers sumps, or pit areas since vapor is heavier than air and can create a suffocation atmosphere. Capture material for recycle or destruction if suitable equipment is available.

Notify applicable government authority if release is reportable or could adversely affect the environment.

7. HANDLING AND STORAGE

HANDLING:

Wear appropriate personal protective equipment. A safety shower and eyewash station should be nearby and ready for use.

This product is a flammable, liquefied gas, which exits the container at temperatures capable of causing freeze burns (frostbite). Ensure personnel are trained in handling and storing cylinders. Secure containers at all times. Keep containers closed when not in use.

Ensure there is adequate ventilation or use proper respiratory protection in poorly ventilated or confined areas. Avoid causing and inhaling high concentration or vapor. Atmospheric levels should be controlled to below the occupational exposure limit and kept as low as practicable.

Prevent liquid or vapor from entering sumps or sewers since vapor is heavier than air and may form suffocating atmospheres.

Do not put mixtures of HFC-32 with air or oxygen under pressure; do not use such mixtures for leak or pressure testing. Do not heat containers.

Liquid transfers between containers may generate static electricity. Ensure adequate grounding.

Avoid trapping liquid between closed valves or overfilling containers as high pressures can develop with an increase in temperature.

Avoid R448A contact with flames or very hot surfaces.

STORAGE RECOMMENDATIONS:

Keep containers tightly closed, in a cool, well-ventilated place. Keep containers dry. Keep from incompatibles, open flames, hot surfaces, welding operations, and other heat sources.

STORAGE TEMPERATURE:

Store at temperature not exceeding 122 deg. F. (50deg. C).

INCOMPATIBILITIES:

Freshly abraded aluminum surfaces at specific temperatures and pressures may cause a strong exothermic reaction. Chemically reactive metals: potassium, calcium, powdered aluminum, magnesium, and zinc.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

Use ventilation to maintain safe levels. Where appropriate engineering controls are not in place or are inadequate, wear suitable respiratory equipment.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION:

Take all precautions to prevent skin contact. Use gloves and protective clothing made of material that has been found by user to be impervious under conditions of use to prevent the skin from becoming frozen for contact with liquid. User should verify impermeability under normal conditions of use prior to general use. Additional protection such as an apron, arm covers, may be need depending on conditions of use.

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EYE PROTECTION:

Use chemical safety goggles or safety glasses and a face shield when there is potential for eye contact.

RESPIRATORY PROTECTION:

Not normally needed if controls are adequate. If needed, use NIOSH/MSHA approved respirator for organic vapors. For high concentrations and oxygen-deficient atmospheres, use positive pressure air-supplied respirator.

OTHER PROTECTION:

Shower and eye wash station.

EXPOSURE GUIDELINES

<u>INGREDIENT NAME</u>	<u>ACGIH TLV</u>	<u>OSHA PEL</u>	<u>OTHER LIMIT</u>
Difluoromethane	None	None	*1000 ppm TWA (8hr)
2,3,3,3-Tetrafluoroprop-1-EN	None	None	*500 ppm TWA (8hr)
Pentafluoroethane	None	None	*1000 ppm TWA (8hr)
trans-1,3,3,3-Tetrafluoropropene	None	None	*800 ppm TWA (8hr)
1,1,1,2-Tetrafluoroethane	None	None	*1000 ppm TWA (8hr)

* = Workplace Environmental Exposure Level (AIHA)
Minimize exposure in accordance with good hygiene practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Colorless, clear liquid
PHYSICAL STATE:	Gas (vapour), Liquid
ODOR:	Slight ethereal odor
SOLUBILITY IN WATER (weight %):	Sparingly soluble / Insoluble
BOILING POINT:	-45.9 °C (-50.6 °F)
VAPOR PRESSURE (mmHg at 20 deg. C):	~10700 mmHg (14.2 bar)
FLASH POINT:	Not applicable (N/A)
EVAPORATION RATE:	Not applicable (N/A)
FLAMMABILITY:	Non-flammable (A1)
LEL/UEL:	Not applicable (N/A)
PARTITION COEFF (n-octanol/water)	Variable (Component Dependent)
AUTO IGNITION TEMP:	Not available (N/A)
DECOMPOSITION TEMPERATURE:	>250 °C
VISCOSITY:	Not applicable (N/A)
VAPOR DENSITY (air = 1.0):	~3.05
% VOLATILES BY VOLUME	100% (Saturated vapor)
DENSITY:	~1.10
pH:	Not available (N/A)
MELTING POINT:	Not available (N/A)
SPECIFIC GRAVITY (water = 1.0):	~1.10
MOLECULAR FORMULA:	Mixture (See composition)
MOLECULAR WEIGHT:	86.3 g/mol

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY:

Stable under normal conditions.

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INCOMPATIBILITIES:

Reacts with finely divided metals such as aluminum, zinc, magnesium, and alloys containing more than 2% magnesium. Can react violently if in contact with alkali metals and alkaline earth metals such as sodium, potassium, or barium.

HAZARDOUS DECOMPOSITION PRODUCTS:

Hydrogen fluoride by thermal decomposition and hydrolysis.

CONDITIONS TO AVOID:

Keep away from heat, sparks, and flame. Avoid high temperatures.

HAZARDOUS POLYMERIZATION:

Will not occur.

11. TOXICOLOGICAL INFORMATION

POSSIBLE HUMAN HEALTH EFFECTS:**Routes of Exposure:**

Inhalation, ingestion, eye, and skin contact.

Inhalation: Exposure to high vapor concentrations may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations can cause anesthetic effects progressing from dizziness, weakness, nausea, to unconsciousness. It can act as an asphyxiant by limiting available oxygen.

Ingestion: Highly unlikely, but should this occur, freeze burns will result.

Eye Contact: Liquid splashes or spray may cause freeze burns.

Skin Contact: Liquid splashes or spray may cause freeze burns.

Other Effects: None anticipated.

Carcinogenicity: See Below

Ingredient Name**NTP STATUS****ACGIH****IARC STATUS****OSHA LIST**

No ingredients listed in this section

12. ECOLOGICAL INFORMATION

PERSISTENCE AND DEGRADATION:

R-448A is an HFC/HFO blend. HFC components degrade via atmospheric reaction, while HFO components have extremely short atmospheric lifetimes (~10-14 days) and rapid photolysis. The mixture is not PBT/vPvB and does not persist in the environment.

EFFECT ON EFFLUENT TREATMENT:

R-448A is a gaseous refrigerant with very low water solubility, so it does not normally enter wastewater and has no direct impact on effluent treatment. Leaked refrigerant volatilizes rapidly, with trace amounts posing no risk to treatment processes. Do not discharge leak-related rinse water directly.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD:

Dispose of in accordance with Federal, State, and local regulations

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CONTAINER DISPOSAL:

May contain explosive vapors. Do not distribute, make available, furnish, or reuse container when emptied of the original product. Do not weld or use cutting torch on or near container. Empty container retains product residue. Return containers to supplier.

14. TRANSPORT INFORMATION

US DOT ID NUMBER: UN 3163

US DOT PROPER SHIPPING NAME: LIQUEFIED GAS, N.O.S. (Difluoromethane, Pentafluoroethane, 1,1,1,2-Tetrafluoroethane, 2,3,3,3-Tetrafluoropropene, trans-1,3,3,3-Tetrafluoropropene)

US DOT HAZARD CLASS: 2.2

US DOT PACKING GROUP: Not applicable

15. REGULATORY INFORMATION

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

SARA 311/312 Hazards

: Gases under pressure

Simple Asphyxiant

SARA 313

: 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.

US State Regulations

Pennsylvania Right To Know

Difluoromethane 75-10-5

Pentafluoroethane 354-33-6

1,1,1,2-Tetrafluoroethane 811-97-2

2,3,3,3-Tetrafluoropropene 754-12-1

trans-1,3,3,3-Tetrafluoropropene 29118-24-9

California List of Hazardous Substances

Difluoromethane 75-10-5

International Regulations

Montreal Protocol : None of the components are ozone-depleting substances (ODP=0)

Additional regulatory information

2,3,3,3-Tetrafluoropropene 754-12-1 trans-1,3,3,3-Tetrafluoropropene 29118-24-9

The United States Environmental Protection Agency (USEPA) has established a Significant New Use Rule (SNUR) for this product as an acceptable substitute for high-GWP refrigerants in commercial refrigeration applications.

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Rule (SNUR) for one of the components in this product.

See 40 CFR § 721.10182

This material contains one or more substances which requires export notification under TSCA Section 12(b) and 40 CFR Part 707 Subpart D:

2,3,3,3-Tetrafluoropropene (754-12-1), trans-1,3,3,3-Tetrafluoropropene (29118-24-9)

16. OTHER INFORMATION

CURRENT ISSUE DATE: January, 2026

OTHER INFORMATION: HMIS Classification: Health – 1, Flammability – 1, Physical Hazard – 3

Regulatory Standards:

1. OSHA regulations for compressed gases: 29 CFR 1910.101
2. DOT classification per 49 CFR 172.101

DISCLAIMER:

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