

Emergency Telephone Numbers:

(817) 636-2089 RHOME PLANT
(800) 424-9300 CHEMTREC

Product Name: R-404A

Company identification: Diversified Pure Chem
11050 S. Hwy 287
Rhome, TX 76078

SECTION I PRODUCT IDENTIFICATION / COMPANY INFORMATION

Cas Registry #: 420-46-2 / 354-33-6 / 811-97-2
Chemical Family: Hydrofluorocarbon Mixture
Chemical Name: 1,1,1-Trifluoroethane(R143a) / Pentafluoroethane(R125) / 1,1,1,2-Tetrafluoroethane(R134a)
Chemical Formula: CF₃CH₃ / CF₃CHF₂ / CF₃CH₂F

SECTION II COMPOSITION / DATA ON COMPONENTS

GHS Classification: Gases Under Pressure – Liquefied Gas, H280

**GHS Label Elements
Symbol(s):**



Signal Words: Warning

GHS Hazard Statements: **Physical Hazards**
 H280: Contains gas under pressure; may explode if heated.
Gas may reduce oxygen in confined spaces.

Health Hazards

Environmental Hazards

Other Hazards

Rapid evaporation of the liquid may cause frostbite. Vapors are heavier than air and can cause suffocation by reducing available oxygen. May cause cardiac arrhythmia. Misuse or intentional inhalation can be fatal as a result of effects on the heart, without alarming symptoms.

GHS Precautionary Statements

Prevention:
Response:
Storage: P410+P403: Protect from sunlight. Store in a well-ventilated place.

SECTION III COMPOSITION / INFORMATION ON INGREDIENTS

INGREDIENT	CAS No.	TARGET (WT%)
1,1,1-Trifluoroethane (R143a)	420-46-2	52
Pentafluoroethane (R125)	354-33-6	44
1,1,1,2-Tetrafluoroethane (R134a)	811-97-2	4

SECTION IV FIRST AID MEASURES
Emergency First Aid Procedures

Eye Contact: For liquid contact, irrigate with running water for minimum of 15 minutes. Seek medical attention.

Skin Contact: For liquid contact, warm areas gradually and get medical attention if there is evidence of frost bite or tissue damage. Flush area with lukewarm water. Do not rub affected area. If blistering occurs, apply a sterile dressing. Seek medical attention.

Inhalation: Remove to fresh air. Artificial respiration and/or oxygen may be necessary. Consult a physician.

Ingestion: This material is a gas under normal atmospheric conditions and ingestion is unlikely.

Most important symptoms and effects

Acute: Anesthetic effects at high concentrations.

Delayed: None known or anticipated. See Section 11 for information on effects from chronic exposure, if any.

Notes to Physician: Epinephrine and other sympathomimetic drugs may initiate cardiac arrhythmias in persons exposed to high concentrations (e.g., in enclosed spaces or with deliberate abuse). The use of other drugs with less arrhythmogenic potential should be considered. If sympathomimetic drugs are administered, observe for the development of cardiac arrhythmias.

SECTION V FIRE FIGHTING MEASURES
Suitable Extinguishing Media:

This product is non-flammable. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Water Mist, Dry Powder, Foam, Carbon Dioxide.

Fire Fighting Procedures:

Self-contained breathing apparatus (SCBA) is required if containers rupture and contents are released under fire conditions. Cool containers / tanks with water spray. Product is not combustible under normal conditions.

However, this material can ignite when mixed with air under pressure and exposed to strong ignition sources. Do not allow run-off from fire fighting to enter drains or water courses. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Some risk may be expected of corrosive and toxic decomposition products.

Fire may cause evolution of: Hydrogen fluoride, Carbon Monoxide, Carbon dioxide, and Carbonyl halides.

Unusual Fire and Explosion Hazards:

If container is not properly cooled, it can rupture in the heat of a fire. Drains can be plugged and valves made inoperable by the formation of ice if rapid evaporation of large quantities of the liquefied gas occurs.

Hazardous Combustion Products: Hazardous decomposition products may include: Hydrogen Fluoride, Carbonyl fluoride. Carbon Oxides.

NPCA - HMIS RATINGS

HEALTH	1
FLAMMABILITY	0
REACTIVITY	1
PERSONAL PROTECTION	-

(Personal Protection Information To Be Supplied By The User)

SECTION VI ACCIDENTAL RELEASE MEASURES
Steps To Be Taken If Material Is Released or Spilled

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with cleanup.

Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Safety Data Sheet

Personal Precautions: Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus. Keep upwind of leak - evacuate until gas has dispersed. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Environmental Precautions: Stop spill/release if it can be done safely. Water spray may be useful in minimizing or dispersing vapors. If spill occurs on water notify appropriate authorities and advise shipping of any hazard.

Methods for Containment and Clean-Up: Ventilate area using forced ventilation, especially low or enclosed places where heavy vapors might collect. Notify relevant authorities in accordance with all applicable regulations.

Recommended measures are based on the most likely spillage scenarios for this material; however local conditions and regulations may influence or limit the choice of appropriate actions to be taken.

SECTION VII HANDLING AND STORAGE

Precautions for safe handling: Comply with state and local regulations. Avoid contact with skin, eyes and clothing. Avoid breathing vapors. Wash hands thoroughly after handling. Wash clothing after use. Decomposition will occur when product comes in contact with open flame or electrical heating elements. Use good personal hygiene practices and wear appropriate personal protective equipment (see section 8).

Contents are under pressure. Gases can accumulate in confined spaces and limit oxygen available for breathing. Use only with adequate ventilation. Do not enter confined spaces such as tanks or pits without following proper entry procedures such as ASTM D-4276 and 29CFR 1910.146.

Conditions for safe storage: Keep container(s) tightly closed and properly labeled. Use and store this material in cool, dry, well ventilated areas away from heat, direct sunlight. Store only in approved containers. Protect container(s) against physical damage. "Empty" containers retain residue and may be dangerous.

SECTION VIII EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits

Component	ACIGH 2014 TLV (TWA)	ACIGH 2014 TLV (STEL)	OSHA PEL (TWA)	OTHER PEL
1,1,1-Trifluoroethane (R143a)				1000 ppm Honeywell AEL Dupont AEL
Pentafluoroethane (R125)				1000 ppm Honeywell AEL Dupont AEL
1,1,1,2-Tetrafluoroethane (R134a)				1000 ppm Honeywell AEL Dupont AEL

Engineering Controls: Use only with adequate ventilation. Keep container tightly closed. Refrigerant concentration monitors may be necessary to determine vapor concentrations in work areas prior to use of torches or other open flames, or if employees are entering enclosed areas. Use sufficient ventilation to keep employee exposure below recommended limits. Local exhaust should be used when large amounts are released. Mechanical ventilation should be used in low or enclosed places.

Personal Protection:

Eye/Face Protection: The use of eye protection (such as splash goggles) that meets or exceeds ANSI Z.87.1 is

recommended when there is potential liquid contact to the eye. Depending on conditions of use, a face shield may be necessary.

Skin Protection: Impervious, insulated gloves recommended.

Respiratory Protection: Wear NIOSH approved respiratory protection, as appropriate.

Suggestions provided in this section for exposure control and specific types of protective equipment are based on readily available information. Users should consult with the specific manufacturer to confirm the performance of their protective equipment. Specific situations may require consultation with industrial hygiene, safety, or engineering professionals.

SECTION IX PHYSICAL AND CHEMICAL PROPERTIES

Appearance & Odor:	Clear, colorless liquefied gas with a slight ethereal odor.		
Odor Threshold:	No Data		
pH:	Not Applicable		
Melting / Freezing Point:	No Data	Initial Boiling Point / Range:	-46.2 °C (-51.2°F)
Flash Point (Method):	Does not flash	Evaporation Rate:	> 1 (Ethyl Ether = 1.0)
Lower Explosion Limit:	None Per ASTM E681	Upper Explosion Limit:	None per ASTM E681
Vapor Pressure @ 70 °F:	149.3 psig	Vapor Density (air = 1.00):	3.4
Specific Gravity (H₂O = 1.00):	1.05 at 25 °C (77 °F)	Solubility in Water @ 70 °F:	Not Determined
Percent Volatile by Volume:	100%	Auto-ignition temperature:	No Data
Decomposition Data:	No Data	Viscosity:	No Data

SECTION X STABILITY AND REACTIVITY

Stability:	Stable at normal temperatures and conditions
Hazardous Polymerization:	Does not occur
Incompatibility (Materials to Avoid):	Alkali or Alkaline Earth Metals. Powdered Metal. Powdered Metal Salts.
Hazardous Decomposition Products:	Carbon oxides, Hydrogen fluoride, Carbonyl fluoride, Fluorocarbons.
Conditions to Avoid:	Avoid open flames and high temperatures.

SECTION XI TOXICOLOGICAL INFORMATION

Effects Of Over Exposure

- Ingestion:** Aspiration hazard!
- 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.
- Skin Contact:** Contact with evaporating liquid can cause frostbite.
- Eye Contact:** Liquid can cause severe irritation, redness, tearing, blurred vision, and possible freeze burns.

- Specific Target Organ Toxicity (Single Exposure):** Not expected to cause organ effects from single exposure.
- Specific Target Organ Toxicity (Repeated Exposure):** Not expected to cause organ effects from repeated exposure.
- Carcinogenicity:** Not expected to cause cancer. This substance is not listed as a carcinogen by IARC, NTP or OSHA.
- Germ Cell Mutagenicity:** Not expected to cause heritable genetic effects.
- Reproductive Toxicity:** Not expected to cause reproductive toxicity.

Other Comments: High concentrations may reduce the amount of oxygen available for breathing, especially in confined spaces. Hypoxia (inadequate oxygen) during pregnancy may have adverse effects on the developing fetus.

Safety Data Sheet

Information on Toxicological Effects of Components

1,1,1 Trifluoroethane (R143a)

Acute inhalation toxicity	:	LC50: > 540,000 ppm Exposure time: 4 h Species: rat
	:	LC50: > 106 mg/l Exposure time: 4 h Species: rat
Sensitization	:	Cardiac sensitization Species: dogs Note:1,1,1,2-tetrafluoroethane (HFC-134a): Cardiac sensitization threshold (dog): 80000 ppm.
Repeated dose toxicity	:	Species: rat Application Route: Inhalation Exposure time: 90 d NOEL: 40000 ppm Note: Subchronic toxicity
Genotoxicity in vitro	:	Test Method: Ames test Result: negative
	:	Cell type: Human lymphocytes Result: negative
Genotoxicity in vivo	:	Species: mouse Cell type: Bone marrow Application Route: Inhalation Result: negative
Teratogenicity	:	Species: rat Application Route: Inhalation exposure NOAEL, Teratog: 40,000 ppm NOAEL, Maternal: 40,000 ppm Note: Did not show teratogenic effects in animal experiments.
	:	Species: rabbit Application Route: Inhalation exposure NOAEL, Teratog: 40,000 ppm NOAEL, Maternal: 40,000 ppm Note: Did not show teratogenic effects in animal experiments.
Further information	:	Acute toxicity Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Rapid evaporation of the liquid may cause frostbite. Avoid skin contact with leaking liquid (danger of frostbite). May cause cardiac arrhythmia.

Safety Data Sheet

Pentafluoroethane (R-125)

Dermal	:	not applicable
Oral	:	not applicable
Inhalation 4 h LC50	:	> 800000 ppm , rat
Inhalation	:	dog Cardiac sensitization
Skin irritation	:	No skin irritation, Not tested on animals Not expected to cause skin irritation based on expert review of the properties of the substance.
Eye irritation	:	No eye irritation, Not tested on animals Not expected to cause eye irritation based on expert review of the properties of the substance.
Skin sensitization	:	Does not cause skin sensitization., Not tested on animals Not expected to cause sensitization based on expert review of the properties of the substance. There are no reports of human respiratory sensitization.
Repeated dose toxicity	:	Inhalation rat No toxicologically significant effects were found.
Carcinogenicity	:	Overall weight of evidence indicates that the substance is not carcinogenic.
Mutagenicity	:	Did not cause genetic damage in animals. Did not cause genetic damage in cultured mammalian cells. Did not cause genetic damage in cultured bacterial cells.
Reproductive toxicity	:	Evidence suggests the substance is not a reproductive toxin in animals. Information given is based on data obtained from similar substances.
Teratogenicity	:	Animal testing showed no developmental toxicity. Further information : Cardiac sensitisation threshold limit : 490000 mg/m3

1,1,1,2 Tetrafluoroethane (R-134a)

Further information : Cardiac sensitisation threshold limit : 312975 mg/m³
Anaesthetic effects threshold limit : 834600 mg/m³
Did not show carcinogenic or teratogenic effects in animal experiments. Inhalation of decomposition products in high concentration may cause shortness of breath (lung oedema). Rapid evaporation of the liquid may cause frostbite.

Dermal : not applicable

Oral : not applicable

Inhalation 4 h LC50 : 567000 ppm , rat

Inhalation Low Observed:
Adverse Effect : 75000 ppm , dog
Cardiac sensitization

Concentration (LOAEC)

Skin irritation : slight irritation, rabbit

Not expected to cause skin irritation based on expert review of the properties of the substance.

No skin irritation, human

Eye irritation : slight irritation, rabbit

Not expected to cause eye irritation based on expert review of the properties of the substance.

No eye irritation, human

Skin sensitization : Did not cause sensitization on laboratory animals., guinea pig
Not expected to cause sensitization based on expert review of the properties of the substance.

Did not cause sensitization on laboratory animals. There are no reports of human respiratory sensitization.

Repeated dose toxicity : Inhalation
rat

No toxicologically significant effects were found.

Carcinogenicity : Overall weight of evidence indicates that the substance is not carcinogenic.
An increased incidence of benign tumours was observed in laboratory animals.

Mutagenicity : Did not cause genetic damage in animals.
Did not cause genetic damage in cultured mammalian cells.
Did not cause genetic damage in cultured bacterial cells.

Reproductive toxicity : Animal testing showed no reproductive toxicity.

Teratogenicity : Animal testing showed effects on embryo-fetal development at levels equal to or above those causing maternal toxicity.

SECTION XII ECOLOGICAL INFORMATION

Toxicity:

Aquatic Toxicity

Further information on ecology

1,1,1-Trifluoroethane (R-143a)

96 h LC50	:	Oncorhynchus mykiss (rainbow trout) > 100 mg/l not applicable
48 h EC50	:	Daphnia 300 mg/l
Additional ecological Information	:	Accumulation in aquatic organisms is unlikely. This product contains greenhouse gases which may contribute to global warming. Do NOT vent to the atmosphere. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered.

Pentafluoroethane (R-125)

96 h LC50	:	Oncorhynchus mykiss (rainbow trout) > 81.8 mg/l Information given is based on data obtained from similar substances.
96 h LC50	:	Danio rerio (zebra fish) > 200 mg/l Information given is based on data obtained from similar substances.
96 h LC50	:	Oncorhynchus mykiss (rainbow trout) 450 mg/l Information given is based on data obtained from similar substances.
72 h EC50	:	Pseudokirchneriella subcapitata (green algae) > 118 mg/l Information given is based on data obtained from similar substances.
72 h EC50	:	Pseudokirchneriella subcapitata (green algae) > 114 mg/l Information given is based on data obtained from similar substances.
96 h EC50	:	Algae 142 mg/l Information given is based on data obtained from similar substances.
48 h EC50	:	Daphnia magna (Water flea) > 200 mg/l Information given is based on data obtained from similar substances.
48 h EC50	:	Daphnia magna (Water flea) > 97.9 mg/l Information given is based on data obtained from similar substances.

1,1,1,2-Tetrafluoroethane (R-134a)

96 h LC50	:	Oncorhynchus mykiss (rainbow trout) 450 mg/l
72 h EC50	:	Algae > 118 mg/l Information given is based on data obtained from similar substances.
48 h EC50	:	Daphnia magna (Water flea) 980 mg/l

Bioaccumulative Potential: Not expected as having the potential to bioaccumulate.

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Mobility in Soil: Due to the extreme volatility of liquefied gases, air is the only environmental compartment in which they will be found.

Other Adverse Effects: None anticipated.

R-404a : GWP 3922
ODP 0

SECTION XIII DISPOSAL INFORMATION

Waste Disposal

Reclaim by distillation, incinerate, or remove to a permitted waste facility. Comply with applicable Federal, State/Provincial and Local Regulations.

Environmental Hazards

Empty pressure vessels should be returned to the supplier. **** Comply With All State and Local Regulations ****

SECTION XIV TRANSPORT INFORMATION

Transport Information

Refrigerant Gas R-404a
2.2, NON Flammable Gas, UN3337

SECTION XV REGULATIONS

Regulatory Information**Chemical Inventories**

USA TSCA: All components of this product are listed on the TSCA Inventory.

SARA Title III:**CERCLA/SARA (Section 302) Extremely Hazardous Substances and TPQs (in pounds):**

This material does not contain any chemicals subject to the reporting requirements of SARA 302 and 40 CFR 372.

SARA (311, 312) Hazard Class:

Acute Health: Yes
Chronic Health: No
Fire Hazard: No
Pressure Hazard: Yes

SARA (313) Chemicals: Not listed

California Proposition 65: This material does not contain any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

SECTION XVI OTHER INFORMATION

Watch for leaks and spills. Keep containers sealed and store in cool, well-ventilated area. Provide means to control leaks and spills. Do not mix with finely divided alkali or alkaline earth metals. Comply with all state and local regulations.

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 the 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.