



Material Safety Data Sheet

IDENTIFICATION

R-404A REFRIGERANT BLEND

TRADENAMES AND SYNONYMS

HP62, R404A, Forane™ 404A, DuPont™ SUVA® 404A, Genetron® 404A

MANUFACTURER/ DISTRIBUTOR

Compressed Cylinder Services, Inc.
8025 Arjons Drive
San Diego, CA 92126

Product Information: 1-800-610-4571

Emergency: PERS 1-800-633-8253 (International 1-801-629-0667)

DISTRIBUTION DATE

01/01/2013

HAZARD(S) IDENTIFICATION

EMERGENCY OVERVIEW: Colorless, volatile liquid with ethereal and faint sweetish odor. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause asphyxiation in confined spaces. At higher temperatures, (>250°C), decomposition products may include Hydrofluoric Acid (HF) and carbonyl halides.

POTENTIAL HEALTH EFFECTS

INHALATION

R-404A is low in acute toxicity in animals. When oxygen levels in air are reduced to 12-14% by displacement, symptoms of asphyxiation, loss of coordination, increased pulse rate and deeper respiration will occur. At high levels, cardiac arrhythmia may occur.

SKIN CONTACT

Immediate effects of overexposure may include: Frostbite, if liquid or escaping vapor contacts the skin. Irritation would result from a defatting action on tissue.

EYE CONTACT

"Frostbite-like" effects may occur if the liquid or escaping vapors contact the eyes.

ADDITIONAL HEALTH EFFECTS

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.

COMPOSITION/INFORMATION ON INGREDIENTS

Trace impurities and additional material names not listed above may also appear in § Regulatory Information toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.





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COMPONENTS

Material: PENTAFLUOROETHANE (HFC-125) 354-33-6 44
CAS Number: 354-33-6
Weight: 44%

Material: ETHANE, 1,1,1-TRIFLUORO- (HFC-143a)
CAS Number: 420-46-2
Weight: 52%

Material: ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134a)
CAS Number: 811-97-2
Weight: 4%

FIRST-AID MEASURES

INHALATION

If high concentrations are inhaled, immediately remove to fresh air. Keep person calm. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician. Do not give epinephrine (adrenaline).

SKIN CONTACT

In case of contact, immediately flush skin with plenty of water for at least 15 minutes, while removing contaminated clothing and shoes. Call a physician. Wash contaminated clothing before reuse. Treat for frostbite if necessary by gently warming affected area.

EYE CONTACT

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

INGESTION

Ingestion is not considered a potential route of exposure. While unlikely due to the components if ingested contact a physician.

NOTES TO PHYSICIANS

Because of the possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution and only in situations of emergency life support. Treatment of overexposure should be directed at the control of symptoms and the clinical conditions.

FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

Flash Point: No flash point

Flammable Limits in Air, % by Volume:

LEL None per ASTM E681

UEL None per ASTM E681

Autoignition Not Determined

Fire and Explosion Hazards:

Cylinders may rupture under fire conditions. Decomposition may occur. Contact of welding or soldering torch flame with high concentrations of refrigerant can result in visible changes in the size and color of torch flames. This flame effect will only occur in concentrations of product well above the recommended exposure limit, therefore stop all work and ventilate to disperse refrigerant vapors from the work area before using any open flames.





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R-404A is not flammable in air at temperatures up to 100 deg. C (212 deg. F) at atmospheric pressure. However, mixtures of R-404A with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. R-404A can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing R-404A and air, or R-404A in an oxygen enriched atmosphere become combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, R-404A should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example R-404A should NOT be mixed with air under pressure for leak testing or other purposes.

Experimental data have also been reported which indicate combustibility of HFC-134a in the presence of certain concentrations of chlorine.

EXTINGUISHING MEDIA

Use media appropriate for surrounding material.

FIRE FIGHTING INSTRUCTIONS

Cool tank/container with water spray or fog. Self-contained breathing apparatus (SCBA) may be required if cylinders rupture or release under fire conditions.

Water runoff should be contained and neutralized prior to release.

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 area, especially low or enclosed places where heavy vapors might collect. Remove open flames. Use self-contained breathing apparatus (SCBA) if large spill or leak occurs.

HANDLING AND STORAGE

HANDLING (PERSONNEL)

Use with sufficient ventilation to keep employee exposure below recommended limits. Avoid breathing vapors.

HANDLING (PHYSICAL)

R-404A should not be mixed with air for leak testing or used for any other purpose above atmospheric pressure. See § Flammable Properties. Contact with chlorine or other strong oxidizing agents should also be avoided.

STORAGE

Store in a clean, dry place. Do not heat above 52 C (126 F). Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Do NOT drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Never attempt to lift cylinder by its cap. Use a pressure reducing regulator when connecting cylinder to lower pressure (>3000 psig) piping or systems. Do NOT heat cylinder. Use a check valve or trap in the discharge line to prevent hazardous back flow into the cylinder. Cylinders should be stored upright and firmly secured to prevent falling or being knocked over. Separate full containers from empty containers. Storage area temperatures should not exceed 125 deg F (52 deg C) and should be free of combustible materials. Avoid area where salt or other corrosive materials are present. Avoid excessive inventory= and storage time. Use a first-in first-out system. Keep accurate inventory records.

EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS



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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. 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.

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 LIMITS

PENTAFLUOROETHANE (HFC-125)

PEL (OSHA): None Established
TLV (ACGIH): None Established
WEEL (AIHA): 1000 ppm, 4900 mg/m³, 8 Hr. TWA

ETHANE, 1,1,1-TRIFLUORO- (HFC-143a)

PEL (OSHA): None Established
TLV (ACGIH): None Established
WEEL (AIHA): 1000 ppm, 8 Hr. TWA

ETHANE, 1,1,1,2-TETRAFLUORO- (HFC-134a)

PEL (OSHA): None Established
TLV (ACGIH): None Established
WEEL (AIHA): 1000 ppm, 8 Hr. TWA

OTHER EXPOSURE LIMITS FOR POTENTIAL DECOMPOSITION PRODUCTS:

Hydrogen Fluoride: ACGIH TLV: 3 ppm ceiling

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA

Chemical Formula: CHF₂CF₃, CH₃CF₃, CH₂FCF₃
Molecular Weight: 120
Boiling Point: -46.7 C (-52.1 F) Average
Vapor Pressure: 182.1 psia at 25 deg C (77 deg F)
% Volatiles: 100 WT%
Evaporation Rate: (CL4 = 1) Greater than 1
Solubility in Water: Not determined
Odor: Slight ethereal
Form: Liquefied gas
Color: Clear, colorless
Specific Gravity: 1.05 @ 25C (77F)

STABILITY AND REACTIVITY

CHEMICAL STABILITY

Stable.

CONDITIONS TO AVOID

Avoid open flames and high temperatures.



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INCOMPATIBILITY WITH OTHER MATERIALS

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

DECOMPOSITION

Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid and possibly carbonyl fluoride. These materials are toxic and irritating. Contact should be avoided.

CONDITIONS TO AVOID

Avoid open flames and high temperatures.

POLYMERIZATION

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

ANIMAL DATA

The blend is untested.

HFC-125

Inhalation 4 hour ALC: > 709,000 ppm in rats

Single, high inhalation exposures caused lethargy, decreased activity, labored breathing and weight loss. Weak cardiac sensitization effect, a potentially fatal disturbance of heart rhythm caused by a heightened sensitivity to the action of epinephrine. Lowest-Observed-Adverse-Effect-Level for cardiac sensitization: 100,000 ppm. Repeated exposure caused: No significant toxicological effects. No-Observed-Adverse-Effect-Level(NOEL): 50,000 ppm

No animal data are available to define carcinogenic, developmental or reproductive hazards. In animal testing this material has not caused developmental toxicity. HFC-125 does not produce genetic damage in bacterial or mammalian cell cultures or when tested in animals (not tested for heritable genetic damage).

HFC-134a

Inhalation 4-hour LC50: 567,000 ppm in rats

Single exposure caused: Cardiac sensitization, a potentially fatal disturbance of heart rhythm associated with a heightened sensitivity to the action of epinephrine. Lowest-Observed-Adverse-Effect-Level for cardiac sensitization: 75,000 ppm. Single exposure caused: Lethargy. Narcosis, increased respiratory rates. These effects were temporary. Single exposure to near lethal doses caused: Pulmonary edema. Repeated exposure caused: Increased adrenals, liver, spleen weight. Decreased uterine, prostate weight. Repeated dosing of higher concentrations caused: the following temporary effects - Tremors. Incoordination.

CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS:

In a two-year inhalation study, HFC-134a, at a concentration of 50,000 ppm, produced an increase in late occurring benign testicular tumors, testicular hyperplasia and testicular weight. The no-effect-level for this study was 10,000 ppm. Animal data show slight fetotoxicity but only at exposure levels producing other toxic effects in the adult animal. Reproductive data on male mice show: No change in reproductive performance. Tests have shown that this material does not cause genetic damage in bacterial or mammalian cell cultures, or in animals. In animal testing, this material has not caused permanent genetic damage in reproductive cells of mammals (has not produced heritable genetic damage).

HFC-143a

Inhalation 4-hour LC50: >540,000 ppm in rats

Single exposures by inhalation to 500,000 ppm caused anesthesia but no mortality at 540,000 ppm. Cardiac sensitization occurred in dogs at 300,000 ppm following an intravenous challenge with epinephrine. Two, 4-week inhalation have been





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conducted. In the first study, pathological changes in the testes were observed at all exposure concentrations; no effects were observed in females. The testicular effect was considered related to the method used to expose the rats to HFC-143a. In the second study using the same exposure concentrations, no effects were noted in males at any concentration. Data from a 90-day study revealed no effects in male or female rats at exposures up to 40,000 ppm. Long-term exposure caused significantly decreased body weights in male rats fed 300 mg/kg for 52 weeks, but there was no effect on mortality. Tests in rats demonstrated no carcinogenic activity when administered orally 300 mg/kg/day for 52 weeks and observed for an additional 73 weeks. Tests in bacterial cell cultures demonstrated mutagenic activity, but the compound did not induce transformation of mammalian cells in culture or in the whole animal. Tests in animals demonstrate no developmental toxicity.

ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

AQUATIC TOXICITY:

HFC 143a
96-hour LC50, Rainbow trout >40 mg/L

HFC-134a
48-hour EC50, Daphnia magna 980 mg/L
96-hour LC50, Rainbow trout 450 mg/L

DISPOSAL CONSIDERATIONS

RCRA INFORMATION

Hazardous Waste Not Hazardous Waste
RCRA ID No N/A

Disposal must comply with federal, state, and local disposal or discharge laws. R-134A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling. Reclaim by distillation or remove to a permitted waste facility.

TRANSPORTATION INFORMATION

SHIPPING INFORMATION

US ICC/ DOT

Proper Shipping Name: Refrigerant Gas R-404A
Hazard Class: 2.2
Packing Group Not Applicable
UN No.: 3337
ERG No: 126
Label: NON-FLAMMABLE GAS

IMO/ IMDG

Proper Shipping Name: Refrigerant Gas R-404A
Hazard Class: 2.2
UN No.: 3337
Label: NON-FLAMMABLE GAS

ICAO/ IATA

Proper Shipping Name: Refrigerant Gas R-404A
Hazard Class: 2.2
UN No.: 3337
Label: NON-FLAMMABLE GAS



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Packing Group: 200

ICAO/ IATA Maximum Quantity Allowed

Cargo ≤150kg

Passenger ≤75kg

REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS

TSCA Inventory Status: Reported/Included.

SARA TITLE III CERCLA HAZARD CLASSIFICATIONS

Acute: No

Chronic: No

Fire: No

Reactivity: No

Pressure: Yes

SARA Extremely Hazardous Substance (40 CFR Part 355): No

CERCLA Hazardous Substance: No

SARA §313 Toxic Chemical: No

WARNING: DO NOT vent to the atmosphere. Contains Pentafluoroethane (HFC-125), 1,1,1-trifluoroethane, tetrafluoroethane, greenhouse gases which may contribute to global warming. To comply with provisions of the U.S. Clean Air Act, any residual must be recovered

OTHER INFORMATION

NFPA, NPCA-HMIS

NPCA-HMIS Rating		
Health	1	
Flammability	0	
Reactivity	1	

ANSI/ ASHRAE 34 Safety Group – A1

DISCLAIMER

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REGULATORY STANDARDS

[OSHA Standards 29 CFR §1910.1200\(g\) HAZARD Communication: Safety Data Sheets](#)

[DOT Title 49 CFR §172.101 List of Hazardous Substances and Reportable Quantities](#)

[ANSI Z400.1/Z129.1-2010 Hazardous Workplace Chemicals - Hazard Evaluation and Safety Data Sheet and Precautionary Labeling Preparation](#)

[NFPA 704: Standard System for the Identification of the Hazards of Materials for Emergency Response](#)





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CID COMMERCIAL ITEM DESCRIPTION

[A-A-58060 Fluorocarbon and Other Refrigerants](#)

NSN NATIONAL STOCK NUMBER REFERENCE

6830-01-391-3104	6830-01-392-0959	6830-01-392-0960
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