



MATERIAL SAFETY DATA SHEET

R-404A

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFICATION	Product Name	R404A
	Chemical Formula	C_2HF_5 $C_2H_2F_4$ CH_2F_2
	Trade Name	R404A

COMPANY IDENTIFICATION	DIKKO COOL REFRIGERANT INC. DALLAS, USA Tel No. : +12055234666
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2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
1,1,1-Trifluoro(HFC-143a)	420-46-2	52
Pentafluoroethane (HFC-125)	354-33-6	44
1,1,1,2-Tetrafluoroethane (HFC-134a)	811-97-2	4

3. HAZARDS 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

SKIN: Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.

EYES: Liquid contact can cause severe irritation and frostbite. Mist may irritate.

INHALATION: Genetron 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.

INGESTION: Ingestion is unlikely because of the low boiling point of the material. Should it occur, discomfort in the gastrointestinal tract from rapid evaporation of the material and



consequent evolution of gas would result. Some effects of inhalation and skin exposure would be expected.

DELAYED EFFECTS: None known

4. FIRST AID MEASURES

SKIN: Promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Get medical attention if symptoms persist.

EYES: Immediately flush eyes with large amounts of water for at least 15 minutes (in case of frostbite water should be lukewarm, not hot) lifting eyelids occasionally to facilitate irrigation. Get medical attention if symptoms persist.

INGESTION: Ingestion is unlikely because of the physical properties and is not expected to be hazardous. Do not induce vomiting unless instructed to do so by a physician.

INHALATION: Immediately remove to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention. Do not give epinephrine (adrenaline).

ADVICE TO PHYSICIAN: 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.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES: FLASH POINT: Will not burn

AUTOIGNITION TEMPERATURE: <750°C

UPPER FLAME LIMIT (volume % in air): Not applicable

LOWER FLAME LIMIT (volume % in air): Not applicable

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

EXTINGUISHING MEDIA: Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable)

FIRE AND EXPLOSION HAZARDS: 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.

UNUSUAL FIRE AND EXPLOSION HAZARDS: Genetron 404A is not flammable at ambient temperatures and atmospheric pressure. However, this material will become combustible



when mixed with air under pressure and exposed to strong ignition sources. Contact with certain reactive metals may result in formation of explosive or exothermic reactions under specific conditions (e.g. very high temperatures and/or appropriate pressures).

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS: Firefighters should wear self-contained, NIOSH-approved breathing apparatus for protection against possible toxic decomposition products. Proper eye and skin protection should be provided. Use water spray to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.) Evacuate unprotected personnel. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return until air has been tested and determined safe, including low-lying areas.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.) Avoid breathing vapors and liquid contact with eyes, skin or clothing. Do not puncture or drop cylinders, expose them to open flame or excessive heat. Use authorized cylinders only. Follow standard safety precautions for handling and use of compressed gas cylinders.

404A should not be mixed with air above atmospheric pressure for leak testing or any other purpose.

STORAGE RECOMMENDATIONS: Store in a cool, well-ventilated area of low fire risk and out of direct sunlight. Protect cylinder and its fittings from physical damage. Storage in subsurface locations should be avoided. Close valve tightly after use and when empty.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide local ventilation at filling zones and areas where leakage is probable. Mechanical (general) ventilation may be adequate for other operating and storage areas.

SKIN: Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with the liquid or gas is anticipated, insulated gloves constructed of PVA, neoprene or butyl rubber should be used. Any contaminated clothing should be promptly removed and washed before reuse.

EYE: For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.

RESPIRATORY PROTECTION: None generally required for adequately ventilated work situations. For accidental release or non-ventilated situations, or release into confined space, where the concentration may be above the PEL of 1,000 ppm, use a self-contained, NIOSH -approved breathing apparatus or supplied air respirator. For escape: use the



former or a NIOSH-approved gas mask with organic vapor canister.

ADDITIONAL RECOMMENDATIONS: Where contact with liquid is likely, such as in a spill or leak, impervious boots and clothing should be worn. High dose-level warning signs are recommended for areas of principle exposure. Provide eyewash stations and quick-drench shower facilities at convenient locations. For tank cleaning operations, see OSHA regulations, 29 CFR 1910.132 and 29 CFR 1910.133.

9. PHYSICAL AND CHEMICAL PROPERTIES

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)

10. STABILITY AND REACTIVITY

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

INCOMPATIBILITIES: (Under specific conditions: e.g. very high temperatures and/or appropriate pressures) – Freshly abraded aluminum surface (may cause strong exothermic reaction). Chemically active metals: potassium, calcium, powdered aluminum, magnesium and zinc.

HAZARDOUS DECOMPOSITION PRODUCTS: Halogens, halogen acids and possibly carbonyl halides

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

- HFC-125:** LC50 : 4 hr. (rat) - > 800,000 ppm
Cardiac Sensitization threshold (dog) 75,000 ppm.
- HFC-143a:** LC50 : 4 hr. (rat) - > 540,000ppm
Cardiac Sensitization threshold (dog) > 250,000 ppm.
- HFC-134a:** LC50 : 4 hr. (rat) - > 500,000 ppm
Cardiac Sensitization threshold (dog) > 80,000 ppm.

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS:

- HFC-125:** Teratogenic NOEL (rat and rabbit) - 50,000 ppm



Subchronic inhalation (rat) NOEL - \geq ~.ppm

Chronic NOEL – 10,000 ppm

HFC-143a: Teratogenic NOEL (rat and rabbit) - 50,000 ppm

Subchronic inhalation (rat) NOEL - \geq ~.ppm

HFC-134a: Teratogenic NOEL (rat and rabbit) – 40,000 ppm

Subchronic inhalation (rat) NOEL - 50,000 ppm

Chronic NOEL – 10,000 ppm

OTHER DATA:

HFC-125, HFC-134a: Not active in four genetic studies

HFC-143a: Not active in two genetic studies

12. ECOLOGICAL INFORMATION

DEGRADABILITY(BOD): Genetron 404A is a gas at room temperature; therefore, it is unlikely to remain in water.

OCTANOL WATER PARTITION COEFFICIENT: Unknown for mixture

PERSISTENCE AND DEGRADATION:

HFC 143a: Decomposed comparatively rapidly in the lower atmosphere (troposphere).

Atmospheric lifetime is 5.6 year(s). Has a Global Warming Potential (GWP) of 3800 (relative to a value of 1 for carbon dioxide at 100 years).

HFC 125: Decomposed slowly in the lower atmosphere (troposphere). Atmospheric lifetime is 32.6 year(s). Has a Global Warming Potential (GWP) of 2800 (relative to a value of 1 for carbon dioxide at 100 years).

HFC 134a: Decomposed comparatively rapidly in the lower atmosphere (troposphere).

Atmospheric lifetime is 13.6 year(s).Has a Global Warming Potential (GWP) of 1300 (relative to a value of 1 for carbon dioxide at 100 years).

HFC 143a, HFC 125, HFC 134a: Do not influence photochemical smog (i.e. they are not VOCs under the terms of the UNECE agreement). Do not deplete ozone.

13. DISPOSAL CONSIDERATIONS

RCRA

Is the unused product a RCRA hazardous waste if discarded?

Not a hazardous waste.

IF yes, the RCRA ID is:

Not applicable

OTHER DISPOSAL CONSIDERATIONS: Disposal must comply with federal, state, and local disposal or discharge laws. Genetron 404A is subject to U.S. Environmental Protection Agency Clean Air Act Regulations Section 608 in 40 CFR Part 82 regarding refrigerant recycling.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the



material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT PROPER SHIPPING NAME	Refrigerant gas R404A
US DOT HAZARD CLASS	2.2
US DOT PACKING GROUP	Not applicable
US DOT ID NUMBER	UN3337

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA):

TSCA INVENTORY STATUS: Components listed on the TSCA inventory

OTHER TSCA ISSUES: None

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312

Acute	No
Chronic	No
Fire	No
Reactivity	No
Pressure	Yes

LISTS: SARA Extremely Hazardous Substance	-No
CERCLA Hazardous Material	-No
SARA Toxic Chemicals	-No

16. OTHER INFORMATION

All the constituents of this preparation are registered in the EINECS inventory. All the components of this preparation are registered in the TSCA inventory.

17. DISCLAIMER

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