SAFETY DATA SHEET

R-404A

Version 1.0
Revision Date 02/22/2023
Document 10005004

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME : R-404A
OTHER NAME : 1,1,1 Trifluoroethane, Pentafluoroethane, 1,1,1,2 Tetrafluoroethane
PRODUCT USE : Refrigerant gas, for professional use only
Restrictions : Do not use product for anything outside of the above specified uses

SUPPLIER : RGAS, LLC
2777 Allen Pkwy, Suite 1185
Houston, Texas 77019

FOR MORE INFORMATION CALL:
(Monday – Friday, 8:00am– 5:00pm)
281-953-5550

IN CASE OF EMERGENCY CALL:
CHEMTREC: 1-800-424-9300

SECTION 2 - HAZARDS IDENTIFICATION SUMMARY

(As defined by OSHA Hazard Communication Standard, 29 CFR 1910.1200)

CLASSIFICATION : Gases under pressure, Liquefied Gas
SIGNAL WORD : Warning
HAZARD STATEMENT : Contains gas under pressure, may explode if heated.

SYMBOL/PICTOGRAM : Gas cylinder 

HAZARD PREVENTION : Protect from sunlight. Store in a well-ventilated area.

OTHER HAZARDS
Misuse or intentional inhalation may lead to death without warning. Vapors are heavier than air and can cause asphyxiation in confined spaces by reducing oxygen available for breathing. liquid refrigerant exposure to eyes or skin may cause frostbite due to rapid evaporation of the liquid. Wear protective gloves / eye protection / face protection.

SECTION 3 - COMPOSITION, INFORMATION OF INGREDIENTS

Composition	CAS Number	Weight
1,1,1-Trifluoroethane (HFC-143A)	420-46-2	52.00%
Pentafluoroethane (HFC-125)	354-33-6	44.00%
1,1,1,2-Tetrafluroethane (HFC-134A)	811-97-2	4.00%

SECTION 4 - FIRST AID MEASURES

GENERAL ADVICE	: In the case of an accident or if you feel unwell, seek medical advice immediately. If symptoms persist or in all cases of doubt seek medical advice.
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).
SKIN CONTACT	: Rapid evaporation of the liquid may cause frostbite. In case of contact with liquid, promptly flush skin with water until all chemical is removed. If there is evidence of frostbite, bathe (do not rub) with lukewarm water. Get medical attention if symptoms persist.
EYE CONTACT	: Immediately flush eyes with plenty of water, also under the eyelids, for at least 15 minutes. If eye irritation persists, consult a specialist.
INGESTION	: Ingestion is unlikely because of the physical properties and is not expected to be hazardous. As this product is a gas, refer to the inhalation section.
NOTES 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.

SECTION 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA	:This product is non-flammable – ASTM D 56-82, ASTM E-681 Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
UNSUITABLE EXTINGUISHING MEDIA	: No applicable data available
SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE	: 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. Cylinders are equipped with pressure and temperature relief devices but may still rupture under fire conditions. 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.

Fire may cause evolution of:
Halogenated compounds
Hydrogen fluoride
Carbon oxides
Carbonyl halides

SECTION 6 - ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS : Evacuate personnel to safe areas.
Keep people away from and upwind of the spill or leak
Wear personal protective equipment. Keep unprotected people away.
Ventilate the area. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Avoid accumulation of vapors in low areas.
Unprotected personnel should not return until air has been tested and determined safe.

ENVIRONMENTAL PRECAUTIONS : Prevent further leakage or spillage if safe to do so.

SPILL CLEANUP : Evaporates. Ventilate the area.

SECTION 7 - HANDLING AND STORAGE

HANDLING : Handle with care
Always wear recommended personal protection equipment.
Avoid inhalation of vapor or mist.
Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C.
Do not puncture or drop cylinders.
Do not expose the cylinders to open flame or excessive heat.
Do not remove valve cap until immediately ready for use.
Always replace cap after use.
Follow all standard safety precautions for handling and use of compressed gas cylinders.

STORAGE : Pressurized cylinder: Keep cylinders tightly closed in a cool, well-ventilated area of low fire risk and out of direct sunlight.
Do not expose to temperatures exceeding 50°C
Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured and ready for use.
Protect cylinder and its fittings from physical damage.
Storage in subsurface location should be avoided
Do not store with the following product types:
Self-reactive substances and mixtures
Organic peroxides
Oxidizing agents
Pyrophoric liquids/solids
Self-heating substances and mixtures
Acutely toxic substances and mixtures

The product has an indefinite shelf life when stored properly.

SECTION 8 - EXPOSURE CONTROLS, PERSONAL PROTECTION

ENGINEERING CONTROLS : Use sufficient ventilation to keep employee's exposure below recommended limits.
Local exhaust should be used when large amounts are released.
Provide local ventilation in areas where leakage is probable.

PROTECTIVE MEASURES : Do not breathe vapors
Do not get in eyes, skin or on clothing.
Ensure safety showers and eyewash stations are close to the workstation location.
Self-contained breathing apparatus (SCBA) is required if a large release occurs.

PERSONAL PROTECTIVE EQUIPMENT

EYE PROTECTION : For normal conditions, wear safety glasses with side-shields.
Where there is reasonable probability of liquid contact, wear chemical safety goggles or face shield, giving complete protection to eyes.

SKIN AND BODY PROTECTION : Avoid skin contact with leaking liquid refrigerant. Skin contact with refrigerant may cause frostbite.
General work clothing and leather gloves should provide adequate protection. If prolonged contact with the liquid or gas is anticipated, wear impervious cold insulating gloves and face shield.

RESPIRATORY PROTECTION : Under normal manufacturing conditions, no respiratory protection is required when using this product.

EXPOSURE GUIDELINES

Component	ACGIH TLV	OSHA PEL	Other Limit
1,1,1,2-Tetrafluoroethane	None	None	*1,000 PPM TWA (8 hr)
Pentafluoroethane	None	None	*1,000 PPM TWA (8 hr)
1,1,1-Trifluoroethane	None	None	*1,000 PPM TWA (8 hr)

** (AIHA) Workplace Environmental Exposure Level

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE : Liquefied Gas.

COLOR : Colorless.

ODOR : Weak, ether-like.

ODOR THRESHOLD : No applicable data available.

pH	: Neutral.
MELTING POINT	: No data available.
BOILING POINT	: -48°C
VAPOR PRESSURE	: 12,610 hPa at 21.1°C 25,572 hPa at 54.4 °C
VAPOR DENSITY	: 3.43 Note: (Air=1.0)
DENSITY	: 1.08 g/cm3 at 21.1°C
FLASH POINT	: Not applicable.
SOLUBILITY IN WATER	: No data available.
EVAPORATION RATE	: >1 (CCL4=1.0)
FLAMMABILITY	: Not applicable.
LOWER EXPLOSION LIMIT	: None
UPPER EXPLOSION LIMIT	: None
AUTO IGNITION TEMPERATURE	: >750 °C
DECOMPOSITION TEMPERATURE	: >250°C
PARTITION COEFFICIENT n-octanol/water	: No applicable data available.
VISCOSITY	: Not applicable.

SECTION 10 - STABILITY AND REACTIVITY

REACTIVITY	: Stable under normal ambient temperature and pressure.
CHEMICAL STABILITY	: Stable under normal conditions.
POSSIBILITY OF HAZARDOUS REACTIONS	: Hazardous polymerization does not occur.
CONDITIONS TO AVOID	: Do not expose to temperatures exceeding 50°C.

Product decomposes under high temperatures.
Can form a combustible mixture with air at pressures above atmospheric pressure.
Do Not mix with oxygen or air above atmospheric pressures.

INCOMPATIBLE MATERIALS TO AVOID : Powdered metals
Aluminum
Magnesium
Zinc
Potassium
Calcium

HAZARDOUS DECOMPOSITION PRODUCTS : This product can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid (HF), halogen acids, halogens.

SECTION 11 - TOXICOLOGICAL INFORMATION

INHULATION EFFECTS (Accute)
HFC-125: LC50 : Inhalation 4 hr. (rat) - > 800,000 ppm / Cardiac Sensitization threshold (dog) 75,000 ppm.
HFC-143a: LC50 : Inhalation 4hr. (rat) - > 540,000 ppm / Cardiac Sensitization threshold (dog) > 250,000 ppm.
HFC-134a: LC50 : Inhalation 4hr. (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 - > 50,000 ppm / Chronic NOEL – 10,000 ppm.
HFC-143a: Teratogenic NOEL (rat and rabbit) – 50,000 ppm Subchronic inhalation (rat) NOEL - > 50,000 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.

SECTION 12 - ECOLOGICAL INFORMATION

DEGRADABILITY (BOD) : R404A is a gas at room temperature; therefore, it is unlikely to remain in water.

OCTANOL WATER PARTITION COEFFICIENT : Not applicable.

SECTION 13 - DISPOSAL CONSIDERATIONS

DISPOSAL METHODS : Observe all Federal, State and Local Environmental regulations.

NOTE : This product is subject to U.S. Environmental protection Agency Clean Air Act Regulations Section 608 in 40 CFR part 82 regarding refrigerant recycling.

SECTION 14 - TRANSPORT INFORMATION

DOT	UN Number	: 3337
	Proper Shipping Name	: Refrigerant gas R 404A
	Class	: 2.2
	Packing Group	:
	Hazard Label	: 2.2
IATA	UN Number	: 3337
	Description of the goods	: Refrigerant gas R 404A
	Class	: 2.2
	Hazard Label	: 2.2
	Packing Instructions (Cargo Aircraft)	: 200
	Packing Instructions (Passenger Aircraft)	: 200
IMDG	UN Number	: 3337
	Description of the goods	: Refrigerant gas R 404A
	Class	: 2.2
	Hazard Labels	: 2.2
	EmS Number	: F-C, S-V
	Marine pollutant	: no

SECTION 15 - REGULATORY INFORMATION

TSCA : On the inventory, or in compliance with the inventory.

SARA 313 Regulated Chemicals : This material does not contain any chemical components with known CAS numbers that that exceed the threshold (De Minims) reporting levels stablished by SARA Title III, Section 313.

California Prop. 65 : Chemicals known to the State of California to cause cancer, birth defects or any other harm: None known.

SECTION 16 - OTHER INFORMATION

		HMIS III	NFPA
HEALTH HAZARD	:	1	2
FLAMMABILITY	:	1	1
PHYSICAL HAZARD	:	0	
INSTABILITY	:		0

ANSI/ASHRAE 34 SAFETY GROUP : A1

REGULATORY STANDARDS : OSHA regulations for compressed gases: 29 CFR 1910.101

DOT Classification, 49 CFR 172.101

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 safe handling, use, processing, storage, transportation, disposal and release and is not the be considered a warranty or quality specification. The information relates only to the specific material designated and may no be valid for such material used in combination with any other materials or in any process, unless specified in the text.