


Section 1.	Product information and supplier details.
Item code:	
Product name:	Refrigerant 404a
EPA approval code:	HSR001465
Other name:	Pentafluoroethane, 1,1,1-Trifluoroethane & 1,1,1,2-Tetrafluoroethane
Use:	Refrigerant
New Zealand supplier:	Refrigeration specialties Ltd
Physical address:	181a Station Rd, Penrose, Auckland 1061
Phone number:	09 582 0200
Manufacturer:	Global Refrigerants (s) PTE. LTD. 9 TUAS LINK 1, SINGAPORE 638587

EMERGENCY CONTACT 0800 766 764 (National Poison Centre)

Section 2.	Hazard Identification.
GHS Classification:	Gases under pressure, Liquefiable gas
Signal word:	WARNING
Hazard statements:	H280 Contains gas under pressure, may explode if heated.
Pictogram:	 GHS04
Prevention:	P103 Read label before use.
Precautionary statements:	P410-P403 Protect from sunlight, store in a well-ventilated place.
Emergency overview:	Colourless, volatile liquid with ethereal and faint sweetish odour. Non-flammable material. Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapours 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 hazards:	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: 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. 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: No delayed effects known.

Section 3.		Composition Information on Ingredients	
Ingredient:	Weight %	CAS number:	
Pentafluoroethane (HFC-125)	44	354-33-6	
1,1,1-Trifluoroethane (HFC-143a)	52	420-46-2	
1,1,1,2-Tetrafluoroethane (HFC-134a)	4	811-97-2	
There are no impurities or stabilizers that contribute to the classification of the material identified in Section 2			





Section 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.	
Inhalation:	Immediately move to fresh air. If breathing has stopped, give artificial respiration. Use oxygen as required, provided a qualified operator is available. Get medical attention immediately. DO NOT give epinephrine (adrenaline).	
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.	
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.	

Section 5.		Fire fighting measures
Hazard type:	Compressed gas non-flammable	
HAZCHEM code:	2TE	
Decomposition products:	HFC 404A is not flammable under ambient conditions of temperature and pressure. Certain mixtures of HFC 404A and air when under pressure may be flammable. Mixtures of HFC and Chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours.	
Extinguishing media:	Use any standard agent – choose the one most appropriate for type of surrounding fire (material itself is not flammable)	
Precautions for firefighters and special protective clothing:	Stay upwind. Evacuate the personnel away from the fumes. Cool down the containers/ equipment exposed to heat with water spray. Protection of the Fire Fighters: Self Contained breathing apparatus and full protective clothing must be worn in fire conditions.	
Auto ignition temperature:	<750°C	
Flash point:	Not applicable	

Section 6. Accidental release.	
Personal precautions:	Always wear recommended personal protective equipment. Evacuate unprotected personnel. Product dissipates upon release. Protected personnel should remove ignition sources and shut off leak, if without risk, and provide ventilation. Unprotected personnel should not return to the affected area until air has been tested and determined safe, including low-lying areas.
Environmental:	Contain the spilled material, prevent the product from spreading into the environment. Spills and releases must be reported to Worksafe New Zealand
Method of clean up:	Recover as much product as possible if safe to do so.

Section 7. Handling and Storage.	
Normal handling:	Always wear recommended personal protective equipment.) Avoid breathing vapours 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. R-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.
Incompatibilities:	Freshly abraded aluminium surfaces at specific temperatures and pressures may cause a strong exothermic reaction. Chemically reactive metals: potassium, calcium, powdered aluminium, magnesium, and zinc.

Section 8. Exposure controls – personal protection	
Workplace Exposure guidelines (WES)	
Ingredient	WES TWA 8hr.
Pentafluoroethane (HFC-125)	1000ppm
1,1,1-Trifluoroethane (143a)	1000ppm
1,1,1,2-Tetrafluoroethane (HFC-143a)	1000ppm
Workplace Exposure Standard – Time Weighted Average (WES-TWA). The time-weighted average exposure standard designed to protect the worker from the effects of long-term exposure.	
Other exposure guidelines:	Hydrogen Fluoride: ACGIH TLV: 2 ppm ceiling, 0.5 ppm TLV-TWA

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.	
Personal protective equipment:	Respiratory protection	 <p>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:</p>
	Eye protection	 <p>For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear chemical safety goggles.</p>
	Skin protection	  <p>Skin contact with refrigerant may cause frostbite. General work clothing and gloves (leather) should provide adequate protection. If prolonged contact with 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.</p>
Additional controls:	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.	

Section 9.	Physical & Chemical Properties
Appearance:	Clear, colourless liquid and vapor
Odour:	Faint ethereal odour
Odour threshold:	Not established
Boiling point:	-47.2°C – 46.4°C
Freezing Point:	Not determined
Physical state:	Gas at ambient temperatures
Molecular formula:	CHF ₂ CF ₃ , CH ₃ CF ₃ , CH ₂ FCF ₃
Molecular weight:	120
Specific gravity:	1.08 @ 21.1°C
Vapour pressure:	8270mm HG at 20°C
Vapour density:	3.43
Solubility:	Unknown
pH:	Neutral
Oxidising properties:	Non-oxidising material according to EEC criteria
Decomposition temperature:	>250°C
UEL / LEL:	N/A

Section 10.	Stability and reactivity.
Normally stable:	The product is stable.
Conditions to avoid:	Do not mix with oxygen or air above atmospheric pressure. Any source of high temperatures, such as lighted cigarettes, flames, hot spots or welding may yield toxic and/or corrosive decomposition products.
Incompatibilities:	Under specific conditions: e.g. very high temperatures and/or appropriate pressures) – Freshly abraded aluminium surfaces (may cause strong exothermic reaction). Chemically reactive metals: potassium, calcium, powdered aluminium, magnesium, and zinc.
Hazardous decomposition products:	On Combustion or thermal decomposition (Pyrolysis) and Hydrolysis releases toxic gasses (halogenated compounds) (Hydrogen Chloride and Hydrogen Fluoride)
Hazardous polymerization:	Will not occur

Section 11.	Toxicological information.
Acute toxicity:	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
Acute symptoms:	Effects following high level exposure: Headaches, Dizziness, Loss of Consciousness
Delayed (sub chronic and chronic) effects:	HFC-125: Teratogenic NOEL (rat and rabbit) – 50,000 ppm Sub-chronic inhalation (rat) NOEL - > 50,000 ppm / Chronic NOEL – 10,000 ppm HFC-143a: Teratogenic NOEL (rat and rabbit) – 50,000 ppm Sub-chronic inhalation (rat) NOEL - > 50,000 ppm HFC-134a: Teratogenic NOEL (rat and rabbit) – 40,000 ppm Sub-chronic inhalation (rat) NOEL – 50,000 ppm / Chronic NOEL – 10,000 ppm
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:	Irritation would result from a defatting action on tissue. Liquid contact could cause frostbite.
Eye contact:	Liquid contact can cause severe irritation and frostbite. Mist may irritate.
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
Further information:	Acute effects of rapid evaporation of the liquid may cause frostbite. Vapours are heavier than air and can displace oxygen causing difficulty breathing or suffocation. May cause cardiac arrhythmia.

Section 12.		Ecotoxicological Information.
Persistence/Degradability:	Decomposes comparatively rapidly in lower atmosphere (troposphere), products of decomposition will be highly dispersed and hence will have a very low concentration R-404A is a gas at room temperature; therefore, it is unlikely to remain in water.	

Section 13.		Disposal Information.
Do not allow the product to be released into the environment, Consult the manufacturer or supplier for information regarding recovery and recycling of the product, if recovery is not possible Incinerate at a licensed installation.		
Disposal must comply with local disposal or discharge laws. R-404A is subject to the Ozone layer protection 1996		
Reclaim any residual refrigerant from disposable cylinders.		

Section 14.		Transport Information.
United Nations Model number: (UN)	UN3337	
Shipping name:	Non-flammable compressed gas	
Primary classification:	2.2	
Packing group:	None allocated	

Section 15.		Regulatory Information.
DO NOT vent to the atmosphere. To comply with provisions of the Ozone Layer protection Act 1996., any residual must be recovered. Contains Pentafluoroethane (HFC-125), 1,1,1-trifluoroethane (HFC-143a) & 1,1,1,2-Tetrafluoroethane (HFC-134a), a greenhouse gas which may contribute to global warming.		
Certified Handler:	Not applicable	
Controlled substance licence required:	Not applicable	
Tracking required:	Not applicable	

Section 16.		Other Information.
Current date of issue:	1 October 2018	
Management of this product:	HSW (Hazardous Substance) Regulations Part 2 Labelling, signage, safety data sheets and packaging	
	HSW (Hazardous Substance) Regulations Part 4 Certified handlers and supervision and training of workers	
	HSW (Hazardous Substance) Regulations Part 15 Gases under pressure	
	HSW (Hazardous Substance) Regulations Part 3 General duties relating to risk management	
Management of this product must comply with the Ozone Layer protection Act 1996.		

Disclaimer

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