Freon™ 404A Refrigerant

Version 4.0
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This SDS adheres to the standards and regulatory requirements of Malaysia and may not meet the regulatory requirements in other countries.

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product name : Freon™ 404A Refrigerant
: ASHRAE Refrigerant number designation: R-404A

Other names : Suva HP62
404A

Recommended use of the chemical and restriction on use
Recommended use : Refrigerant, For professional users only.

Manufacturer, importer, supplier
Company : The Chemours Malaysia Sdn. Bhd.
Street address : Level 7, Menara CIMB, No 1, Jalan Stesen Sentral 2, Kuala Lumpur Sentral, 50470 Kuala Lumpur
Malaysia
Telephone : +60 3 2859 0700
Telefax : +60 3 2859 9079

Emergency telephone number : 1800-82-0055

2. HAZARDS IDENTIFICATION

Product hazard classification
Gases under pressure : Liquefied gas

Endpoints which are not classified, cannot be classified or are not applicable are not shown.

Label content
Pictogram :

Signal word : Warning

Hazardous warnings : Contains gas under pressure; may explode if heated.

Precautionary statements : Protect from sunlight. Store in a well-ventilated place.

Other hazards
Misuse or intentional inhalation abuse may lead to death without warning.
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Rapid evaporation of the liquid may cause frostbite.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical nature : Mixture

Components

Chemical Name	CAS-No.	Concentration
1,1,1-Trifluoroethane (HFC-143a)	420-46-2	52 %
Pentafluoroethane (HFC-125)	354-33-6	44 %
1,1,1,2-Tetrafluoroethane (HFC-134a)	811-97-2	4 %

4. FIRST AID MEASURES

Never give anything by mouth to an unconscious person. When symptoms persist or in all cases of doubt seek medical advice.

Inhalation : Remove from exposure, lie down. Artificial respiration and/or oxygen may be necessary. Call a physician.

Skin contact : Flush area with lukewarm water. Do not use hot water. If frostbite has occurred, call a physician.

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

Ingestion : Is not considered a potential route of exposure.

Most important symptoms/effects, acute and delayed : Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects., Other symptoms potentially related to misuse or inhalation abuse are:, Anaesthetic effects, Light-headedness, dizziness, confusion, incoordination, drowsiness, or unconsciousness, irregular heartbeat with a strange sensation in the chest, heart thumping, apprehension, feeling of fainting, dizziness or weakness

Protection of first-aiders : If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Notes to physician : Do not give adrenaline or similar drugs.

5. FIREFIGHTING MEASURES

Suitable extinguishing media : As appropriate for combustibles in area. Extinguishant for other burning material in area is sufficient to stop burning.

Specific hazards : Pressure build-up.

Hazardous thermal decomposition products: Carbon oxides Hydrogen fluoride Carbonyl fluoride Fluorocarbons Exposure to decomposition products may be a hazard to health.

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire.

Specific extinguishing methods : No information available.

Further information : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Cool containers/tanks with water spray.
Cool containers/tanks with water spray.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures : Evacuate personnel to safe areas. Ventilate area, especially low or enclosed places where heavy vapours might collect. Refer to protective measures listed in sections 7 and 8.

Environmental precautions : Should not be released into the environment.
In accordance with local and national regulations.

Methods and materials for containment and cleaning up : Evaporates.
Ventilate area using forced ventilation, especially low or enclosed places where heavy vapors might collect.
There are no special clean-up or disposal requirements for household/industrial spills of this product.

7. HANDLING AND STORAGE

Handling

Technical measures/Precautions : Avoid breathing vapours or mist. Avoid contact with skin, eyes and clothing. Provide sufficient air exchange and/or exhaust in work rooms. For personal protection see section 8.

Precautions for safe handling : No special protective measures against fire required.

Storage

Suitable storage conditions : 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.Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems.Never attempt to lift cylinder by its cap.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.Keep at temperature not exceeding 52°C.Do not store near combustible materials.Avoid area where salt or other corrosive materials are present.

Storage period: > 10 yr
Storage temperature: < 52 °C
The product has an indefinite shelf life when stored properly.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

No information available.

Engineering measures : Ensure adequate ventilation, especially in confined areas. Local exhaust should be used when large amounts are released.

Biological occupational exposure limits : No information available.

Personal protective equipment

Respiratory protection : For rescue and maintenance work in storage tanks use self-contained breathing apparatus. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

Hand protection : Material: Impervious gloves

Eye protection : Safety glasses with side-shields, Additionally wear a face shield where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.

Skin protection : No information available.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (Physical state, form, colour, etc.)
Physical state : gaseous
Form : Liquefied gas
Colour : colourless

Odour : slight ether-like

Odour Threshold : No information available.

pH : neutral

Melting point/freezing point
Melting point : Not available for this mixture.

Initial boiling point and boiling range
Boiling point : -46.2 °C

Flash point : does not flash

Evaporation rate : No information available.

Flammability (solid, gas) : No information available.

Upper/lower flammability or explosive limits
Upper explosion limit : No information available.
Lower explosion limit : No information available.

Vapour pressure : 12,546 hPa (25 °C)

23,100 hPa (50 °C)

Vapour density : 3.4 at 25°C (77°F) and 1013 hPa (Air=1.0)

Density
Density : 1.044 g/cm3 (25 °C)
(as liquid)

Solubility(ies)
Water solubility : No information available.

Partition coefficient: n-octanol/water : No information available.

Auto-ignition temperature
Ignition temperature : no data available

Decomposition temperature : 728 °C

Viscosity
Viscosity, kinematic : No information available.

Molecular weight : No information available.

10. STABILITY AND REACTIVITY

Reactivity : Decomposes on heating.

Chemical stability : Stable at normal temperatures and storage conditions.

Possibility of hazardous reactions : No information available.

Conditions to avoid : The product is not flammable in air under ambient conditions of temperature and pressure. When pressurised with air or oxygen, the mixture may become flammable. Certain mixtures of HCFCs or HFCs with chlorine may become flammable or reactive under certain conditions.
Avoid open flames and high temperatures.

Materials to avoid : Alkali metals, Alkaline earth metals, Powdered metals, Powdered metal salts

Hazardous decomposition products : Hazardous thermal decomposition products may include:

Hydrogen fluoride, Carbon oxides, Fluorocarbons, Carbonyl fluoride

SECTION 11: TOXICOLOGICAL INFORMATION

Acute toxicity
Inhalation
1,1,1-Trifluoroethane (HFC-143a) : LC50/4 h/Rat(gas): > 591000 ppm
Method: OECD Test Guideline 403
No Observed Adverse Effect Concentration/Dog(gas): 250000 ppm
Cardiac sensitization
Low Observed Adverse Effect Concentration (LOAEC)/Dog(gas): 300000 ppm
Cardiac sensitization

Pentafluoroethane (HFC-125) : LC50/4 h/Rat(gas): > 800000 ppm
Method: OECD Test Guideline 403
No Observed Adverse Effect Concentration/Dog(gas): 75000 ppm

		Cardiac sensitization Low Observed Adverse Effect Concentration (LOAEC)/Dog(gas): 100000 ppm Cardiac sensitization
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	LC50/4 h/Rat(gas): > 567000 ppm No Observed Adverse Effect Concentration/Dog(gas): 40000 ppm Cardiac sensitization Low Observed Adverse Effect Concentration (LOAEC)/Dog(gas): 80000 ppm Cardiac sensitization

Skin corrosion/irritation

1,1,1,2-Tetrafluoroethane (HFC-134a)	:	Species: Rabbit Result: No skin irritation Classification: Not classified as irritant

Serious eye damage/eye irritation

1,1,1,2-Tetrafluoroethane (HFC-134a)	:	Species: Rabbit Result: No eye irritation Classification: Not classified as irritant

Respiratory or skin sensitisation

1,1,1-Trifluoroethane (HFC-143a)	:	Species: human Result: Does not cause respiratory sensitisation. Classification: Does not cause respiratory sensitisation.
Pentafluoroethane (HFC-125)	:	Species: human Result: Does not cause respiratory sensitisation. Classification: Does not cause respiratory sensitisation.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	Species: Guinea pig Result: Does not cause skin sensitisation. Classification: Does not cause skin sensitisation. Species: Rat Result: Does not cause respiratory sensitisation. Classification: Does not cause respiratory sensitisation.

Germ cell mutagenicity

1,1,1-Trifluoroethane (HFC-143a)	:	Animal testing did not show any mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Pentafluoroethane (HFC-125)	:	Animal testing did not show any mutagenic effects. Evidence suggests this substance does not cause genetic damage in cultured mammalian cells. Did not cause genetic damage in cultured bacterial cells.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	Animal testing did not show any mutagenic effects. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Carcinogenicity

1,1,1-Trifluoroethane (HFC-143a)	:	Not classifiable as a human carcinogen. Animal testing did not show any carcinogenic effects.
Pentafluoroethane (HFC-125)	:	Not classifiable as a human carcinogen. Overall weight of evidence indicates that the substance is not carcinogenic.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	Not classifiable as a human carcinogen. Overall weight of evidence indicates that the substance is not carcinogenic.

Reproductive toxicity

1,1,1-Trifluoroethane (HFC-143a)	:	Reproductive toxicity: No toxicity to reproduction No effects on or via lactation Animal testing showed no reproductive toxicity. Teratogenicity: Animal testing showed no developmental toxicity.
Pentafluoroethane (HFC-125)	:	Reproductive toxicity: No toxicity to reproduction Animal testing showed no reproductive toxicity. Teratogenicity: Animal testing showed no developmental toxicity.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	Reproductive toxicity: No toxicity to reproduction No effects on or via lactation Animal testing showed no reproductive toxicity. Teratogenicity: Animal testing showed no developmental toxicity.

Specific Target Organ Toxicity

Specific target organ toxicity - single exposure

1,1,1-Trifluoroethane (HFC-143a)	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.
Pentafluoroethane (HFC-125)	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	The substance or mixture is not classified as specific target organ toxicant, single exposure.

Specific target organ toxicity - repeated exposure

1,1,1-Trifluoroethane (HFC-143a)	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
Pentafluoroethane (HFC-125)	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

Aspiration hazard

1,1,1-Trifluoroethane (HFC-143a)	:	No aspiration toxicity classification
Pentafluoroethane (HFC-125)	:	No aspiration toxicity classification
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	No aspiration toxicity classification

Other

1,1,1-Trifluoroethane (HFC-143a)	:	Repeated dose toxicity: Inhalation/Rat gas NOAEL: > 40000, Method: OECD Test Guideline 413 No toxicologically significant effects were found.
Pentafluoroethane (HFC-125)	:	Repeated dose toxicity: Inhalation/Rat gas No toxicologically significant effects were found.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	Repeated dose toxicity: Inhalation/Rat gas NOAEL: 50000, No toxicologically significant effects were found.

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity effects

Acute and prolonged toxicity to fish

1,1,1-Trifluoroethane (HFC-143a)	:	LC50/96 h/Oncorhynchus mykiss (rainbow trout): > 40 mg/l Method: OECD Test Guideline 203
Pentafluoroethane (HFC-125)	:	LC50/96 h/Oncorhynchus mykiss (rainbow trout): 450 mg/l Information given is based on data obtained from similar substances.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	LC50/96 h/Oncorhynchus mykiss (rainbow trout): 450 mg/l

Toxicity to aquatic plants

1,1,1-Trifluoroethane (HFC-143a)	:	ErC50/96 h/Pseudokirchneriella subcapitata (green algae): > 44 mg/l Method: OECD Test Guideline 201
Pentafluoroethane (HFC-125)	:	ErC50/96 h/Algae: 142 mg/l Information given is based on data obtained from similar substances. NOEC/72 h/Pseudokirchneriella subcapitata (green algae): 13.2 mg/l Information given is based on data obtained from similar substances.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	ErC50/96 h/Algae: 142 mg/l Information given is based on data obtained from similar substances. NOEC/72 h/Pseudokirchneriella subcapitata (green algae): 13.2 mg/l Information given is based on data obtained from similar substances.

Acute toxicity to aquatic invertebrates

1,1,1-Trifluoroethane (HFC-143a)	:	EC50/48 h/Daphnia magna (Water flea): 300 mg/l Method: OECD Test Guideline 202
Pentafluoroethane (HFC-125)	:	EC50/48 h/Daphnia magna (Water flea): 980 mg/l Information given is based on data obtained from similar substances.
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	EC50/48 h/Daphnia magna (Water flea): 980 mg/l

Persistence and degradability

1,1,1-Trifluoroethane (HFC-143a)	:	Result: Not rapidly biodegradable
Pentafluoroethane (HFC-125)	:	Result: Not rapidly biodegradable
1,1,1,2-Tetrafluoroethane (HFC-134a)	:	Result: Not biodegradable

Bioaccumulation

1,1,1-Trifluoroethane (HFC-143a)	:	Information given is based on data obtained from similar substances.

Mobility in soil

No information available.

Hazardous to the ozone layer

Freon™ 404A Refrigerant	:	Ozone-Depletion Potential: 0

Other adverse effects

No information available.

13. DISPOSAL CONSIDERATIONS

Waste disposal methods : Can be used after re-conditioning. In accordance with local and national regulations.
Dispose of in accordance with local regulations.

Contaminated packaging : Empty pressure vessels should be returned to the supplier.
Disposable containers: Dispose of in accordance with local regulations.

SECTION 14: TRANSPORT INFORMATION

IMDG

UN number	:	3337
Proper shipping name	:	REFRIGERANT GAS R 404A
Class	:	2.2
Marine pollutant	:	no

IATA

UN number	:	3337
Proper shipping name	:	REFRIGERANT GAS R 404A
Class	:	2.2

Matters needing attention for transportation : Not applicable

SECTION 15: REGULATORY INFORMATION

Occupational Safety and Health (Classification, Labelling and Safety Data Sheet of Hazardous Chemicals) Regulations 2013.

16. OTHER INFORMATION

References

SDS Number: 130000000494

Revision Date/Version

Date of first preparation	:	03.12.2007
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Before use read Chemours safety information. For further information contact the local Chemours office or nominated distributors.

Significant change from previous version is denoted with a double bar.

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