

SAFETY DATA SHEET
Refrigerant Gas R422A

Version 1
Revision Date: 26.04.2011



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REFRIGERANT GAS R422A

SECTION 1: IDENTIFICATION OF THE SUBSTANCE / PREPARATION AND OF THE COMPANY / UNDERTAKING

1.1. Product Identifier

Product name: REFRIGERANT GAS R422A

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.3. Details of the supplier of the safety data sheet

Company name:
National Refrigerants Ltd.
4 Watling Close
Sketchley Meadows Business Park
Hinckley LE10 3EZ
Tel: +44(0)1455 630790
Fax: +44(0) 1455 630791
Email: sds@nationalref.com

1.4. Emergency telephone number

Emergency Tel: +44(0) 1865 407333

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Classification under CHIP:

Most important adverse effect: Rapid evaporation of the liquid may cause frostbite.
Vapour is heavier than air and can cause suffocation by reducing oxygen available for breathing.

2.2. Label elements

Label elements under CHIP: Not a hazardous substance or mixture according to EC Directive 67/548/EEC or 1999/45/CE.
Risk phrases None
Safety phrases None
Special labelling of certain mixtures: Contains fluorinated greenhouse gas covered by the Kyoto Protocol.

2.3. Other hazards

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1. Substances

Hazardous Ingredients:

3.2 Mixtures

PENTAFLUOROETHANE (HFC 125)

EINECS	CAS	CHIP Classification	CLP Classification	Percent
206-557-8	354-33-6	N: R58		85%

1,1,1,2-TETRAFLUOROETHANE (HFC 134a)

EINECS	CAS	CHIP Classification	CLP Classification	Percent
212-377-0	811-97-2	N: R58		11%

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ISOBUTANE

EINECS	CAS	CHIP Classification	CLP Classification	Percent
200-857-2	75-28-5	F+: R12		3 – 4%

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

- Skin contact:** Take off all contaminated clothing immediately if not stuck to the skin. Flush area with lukewarm water. Do not use hot water. If frostbite has occurred call a physician.
- Eye contact:** Hold eyelids apart and flush eyes with plenty of water for at least 15 minutes. Get medical attention.
- Ingestion:** This is not considered a potential route of exposure.
- Inhalation:** Remove from exposure, lie down. Move to fresh air. Keep patient warm and at rest. Artificial respiration and/or oxygen may be necessary. Consult a physician.

4.2. Most important symptoms and effects, both acute and delayed

- Skin contact:** Low exposure will cause redness and pain. High exposure will cause frostbite, blisters and severe pain.
- Eye contact:** Cause severe pain and cornea damage.
- Ingestion:** Not a route of exposure.
- Inhalation:** Causes severe headache, dizziness and unconsciousness.
- Delayed/immediate effects:**

4.3. Indication of any immediate medical attention and special treatment needed

- Immediate/special treatment:** Burns pack should be available on the premises.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing media

- Extinguishing media:** Use extinguishing measures that are appropriate to local circumstances and surrounding environment. Cool containers/tanks with water spray.

5.2. Special hazards arising from the substance or mixture

- Special hazards arising from the substance or mixture** Pressure build-up in containers/tanks.
Hazardous thermal decomposition products: carbon oxides, Hydrogen fluoride, Carbonyl fluoride.

5.3. Advice for fire-fighters

- Advice for fire-fighters:** In the event of fire wear self-contained breathing apparatus.
Wear neoprene gloves during cleaning up work after a fire.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

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Personal precautions: Evacuate personnel to safe areas. Ventilate the area.

6.2. Environmental precautions

Environmental precautions: Should not be released into the environment.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Material evaporates.

6.4. Reference to other sections

Reference to other sections: Refer to Section 7 of SDS. Refer to Section 8 of SDS.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Handling requirements: Advice on safe handling: Avoid breathing vapours or mist. Avoid contact with skin and clothing. Provide sufficient air exchange and/or exhaust in work rooms.
Advice on protection against fire and explosion: No special protective measures against fire required.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in cool, dry well ventilated place. Temperature not to exceed 45°C. Keep valves tightly closed.
Suitable packaging: Store in original cylinder only. Protect from contamination.

7.3. Specific end use(s)

Specific end use(s)

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Hazardous ingredients:
PENTAFLUOROETHANE (HFC 125)

Workplace exposure limits

State	8 hour TWA	15 min. STEL
UK	1000 ppm (4900 mg/m ³)	-

1,1,1,2-TETRAFLUOROETHANR (HFC 134a)

Workplace exposure limits

State	8 hour TWA	15 min. STEL
UK	1000 ppm (4240 mg/m ³)	-

ISOBUTANE

Workplace exposure limits

State	8 hour TWA	15 min. STEL
UK	1000 ppm	-

8.2. Exposure controls

Engineering measures: Ensure adequate ventilation, especially in confined areas.
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

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Hand protection: breathing.
Eye protection: Heat insulating gloves.
Safety glasses with side shields. Wear a face shield in addition where the possibility exists for face contact due to splashing, spraying or airborne contact with this material.
Skin protection: Wear clothing that covers legs and arms.
Environmental: Gas escapes to be kept to the minimum by engineering processes and operating methods.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

State: Liquefied gas under pressure
Colour: Clear colourless liquid and vapour.
Odour: Ethereal
Boiling Point: -46.2 to -41.5°C
Flash Point: Non flammable
Ignition Temperature: n/a
Upper explosive limit/upper flammability limit: n/a
Vapour pressure: 10.9 Bar(a) at 20°C
Liquid Density: 1.153 kg/l at 20°C
Vapour Density: 0.066 kg/l at 20°C
Water solubility: Not known but considered very low.
Relative vapour density (Air = 1.0) 3.9

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity

Reactivity: Stable under recommended storage and transport conditions.

10.2. Chemical stability

Chemical stability: Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under recommended storage and transport conditions
May react with aluminium.

10.4. Conditions to avoid

Conditions to avoid: Heat, hot surfaces, flames.

10.5. Incompatible material

Materials to avoid: Alkali metals, alkaline earth metals, powdered metals, powdered metal salts.

10.6. Hazardous decomposition products

Hazardous decomposition products Thermal decomposition yields toxic products which can be corrosive in the presence of moisture.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Relevant effects for mixture:

Effect	Route	Basis

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Symptoms/routes of exposure

Skin contact:	Non toxic. Rapid evaporation of liquid may result in frostbite.
Eye contact:	Non Toxic. Rapid evaporation of liquid may result in frostbite.
Ingestion:	Not considered a route of exposure.
Inhalation:	According to the data on the components it is not classified as harmful by inhalation. Pentafluoroethane: LC50 inhalation, 4hr.: .800 000 ppm (rat) 1,1,1,2-Tetrafluoroethane: LC50 inhalation, 4hr.: .500 000 ppm (rat) Isobutane: LC50 inhalation, 2hr.: .520 000 ppm (mouse)
Delayed/immediate effects:	Effects following high level exposure: headache, dizziness, loss of consciousness. Possible effects following high level exposure: Cardiac disorders, possibility of cardiac arrest.
Other information:	

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity

Ecotoxic values:	When discharged may contribute to the greenhouse effect.
Global Warming Potential (CO² = 1)	Pentafluoroethane (HFC125) 3200 1,1,1,2-Tetrafluoroethane (HFC134a) 1300 Isobutane (HC600a) 3

12.2. Persistence and degradability

Persistence and degradability:	PENTAFLUOROETHANE Vapor-phase pentafluoroethane will be degraded very slowly in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 18 years. 1,1,1,2-TETRAFLUOROETHANE If released to the atmosphere, 1,1,1,2-tetrafluoroethane will undergo a very slow gas-phase reaction with photochemical produced hydroxyl radicals with an estimated half-life of 187 days. The atmospheric lifetime of 1,1,1,2-tetrafluoroethane has been estimated to range from 12.5 to 24 years. ISOBUTANE Gas-phase isobutane will be degraded in the atmosphere by reaction with photochemically-produced hydroxyl and nitrate radicals; the half-life for these reactions in air are estimated to be 6.9 and 165 days, respectively.
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12.3. Bio accumulative potential

Bio-accumulative potential:

12.4. Mobility in soil

Mobility:	PENTAFLUOROETHANE If released to soil, an estimated K _{oc} of 170 indicates pentafluoroethane will have moderate mobility. Volatilization from moist soil surfaces is expected to be an important fate process given an estimated Henry's Law constant of 4.9X10 ⁻² atm-cu m/mole. Pentafluoroethane may potentially volatilize from dry soil surfaces based upon its vapour pressure. 1,1,1,2-TETRAFLUOROETHANE 1,1,1,2-tetrafluoroethane will display moderate to high mobility in soil.
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12.5. Results of PBT and vPvB assessment

PBT identification:

12.6. Other adverse effects

Other adverse effects:

SECTION 13. DISPOSAL CONSIDERATIONS

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13.1. Waste treatment methods

Disposal operations: Do not allow product to be released into the environment.
Recovery Operations: 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 of packaging: De-gas and return cylinders to suppliers.
N.B. The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

SECTION 14. TRANSPORT INFORMATION

14.1. UN Number

UN Number: 3163

14.2. UN Proper Shipping name

UN proper shipping name: LIQUEFIED GAS N.O.S. (Pentafluoroethane, 1,1,1,2-Tetrafluoroethane)

14.3. Transport hazard class(es)

Transport class: 2
ADR/RID Classification code: 2A
ADR/RID Hazard Number: 20

14.4. Packing Group

Packing group: None
Labelling ADR: Label 2.2: Non-flammable, Non-toxic.
IMDG EmS codes: F-C, S-V

14.5. Environmental hazardous

Environmentally hazardous: Greenhouse Gas
Marine pollutant: No

14.6. Special precautions for user

Tunnel code: C/E
Transport category: 3

SECTION 15. REGULATORY INFORMATION

15.1. Safety, health and environment regulations/legislation specific for the substance or mixture

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has not been carried out by the supplier of this mixture.

16. OTHER INFORMATION

Other information: This safety sheet is a new SDS prepared in accordance with Commission Regulation (EU) No. 453/2010.

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GENERAL SAFETY & HANDLING DATA

1. GENERAL

Only trained persons should handle compressed gases. Observe all regulations and local requirements regarding the storage of Cylinders. Do not remove or deface labels provided by the supplier for the identification of the Cylinder contents. Ascertain the identity of the gas before using it. Know and understand the properties and hazards associated with each gas before using it. When doubt exists as to the correct handling procedure for a particular gas contact the supplier.

HANDLING AND USE

Wear stout gloves. Never lift a Cylinder by the cap or guard unless the supplier states it is designed for that purpose. Use trolley or other suitable device or technique for transporting heavy Cylinders, even for a short distance. Where necessary wear suitable eye and face protection. The choice between safety glasses, chemical goggles, or full face shield will depend on the pressure and nature of the gas being used,

Where necessary for toxic gases see that self-contained positive pressure breathing apparatus or full face airline respirator is available in the vicinity of the working area. Employ suitable pressure regulating device on all Cylinders when gas is being emitted to systems with lower pressure rating than that of the Cylinder. Ascertain that all electrical systems in the area are suitable for service with each gas.

Never use direct flame or electrical heating devices to raise the pressure of a Cylinder, Cylinders should not be subjected to temperatures above 45°C. Never re-compress a gas mixture without consulting the supplier. Never attempt to transfer gases from one Cylinder to another. Do not use Cylinders as rollers or supports, or for any other purpose other than to contain the gas as supplied. Never permit oil, grease or other readily combustible substances to come into contact with valves of Cylinders containing oxygen or other oxidants. Keep Cylinder valves clean and free from contaminants particularly oil and water.

Do not subject Cylinders to mechanical shocks which may cause damage to their valves or safety devices.

Never attempt to repair or modify Cylinder valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Close the Cylinder valve whenever gas is not required even if the Cylinder is still connected to the equipment.

2. STORAGE

Cylinders should be stored in a well-ventilated area. Some gases will require a purpose built area. Store Cylinders in a location free from fire risk and away from sources of heat and ignition. Designate as a no smoking area.

Gas Cylinders should be segregated in the storage according to the various categories.

The storage area should be kept clear and access should be restricted to authorized persons only, the area should be clearly marked as a storage area and appropriate hazard warning signs displayed (Flammable, Toxic etc.).

The amount of flammable or toxic gases should be kept to a minimum. Flammable gases should be stored away from other combustible materials.

Cylinders held in storage should be periodically checked for general condition and leakage.

Cylinders in storage should be properly secured to prevent toppling or rolling. Vertical storage is recommended where the Cylinder is designed for this. Cylinder valves should be tightly closed and, where appropriate, valves should be capped or plugged. Protect Cylinders stored in the open against rusting and extremes of weather. Cylinders should not be stored in conditions likely to encourage corrosion. Store full and empty Cylinders separately and arrange full Cylinders so that the oldest stock is used first.

FOR FURTHER INFORMATION CONTACT YOUR NEAREST DISTRIBUTION CENTRE