

Section 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier****Product name:** REFRIGERANT R407F**REACH registered number(s):** MIXTURE**Product code:** R407F**Synonyms:** * GENTRON PERFORMAX LT**1.2. Relevant identified uses of the substance or mixture and uses advised against****Use of substance / mixture:** **Refrigerant**1.3. Details of the supplier of the safety data sheet**

Company name: National Refrigerants Ltd
4 Watling Close
Sketchley Meadows Business Park
Hinckley
Leicestershire
LE10 3EZ
United Kingdom
Tel: 01455 630790
Fax: 01455 630791
Email: sds@nationalref.com

1.4. Emergency telephone number**Emergency tel:** Carechem24 +44 (0)1865 407333**Section 2: Hazards identification****2.1. Classification of the substance or mixture****Classification under CLP:** Press. Gas: H280**Most important adverse effects:** Contains gas under pressure; may explode if heated.**2.2. Label elements****Label elements:****Hazard statements:** H280: Contains gas under pressure; may explode if heated.**Hazard pictograms:** GHS04: Gas cylinder**Signal words:** Warning

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Precautionary statements: * P260: Do not breathe vapours.
P280: Wear protective gloves/eye protection.
P308+313: IF exposed or concerned: Get medical attention.
P410+403: Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

PBT: This product is not identified as a PBT/vPvB substance.

Section 3: Composition/information on ingredients

3.2. Mixtures

Hazardous ingredients:

REFRIGERANT R134A - REACH registered number(s): 01-2119459374-33

| EINECS | CAS | PBT / WEL | CLP Classification | Percent |
|-----------|----------|--|--------------------|---------|
| 212-377-0 | 811-97-2 | Substance with a Community workplace exposure limit. | Press. Gas: H280 | 40.000% |

PENTAFLUOROETHANE - REACH registered number(s): 01-2119485636-25

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|-----------|----------|--|------------------|---------|
| 206-557-8 | 354-33-6 | Substance with a Community workplace exposure limit. | Press. Gas: H280 | 30.000% |
|-----------|----------|--|------------------|---------|

DIFLUOROMETHANE - REACH registered number(s): 01-2119471312-47

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|-----------|---------|--|--|---------|
| 200-839-4 | 75-10-5 | Substance with a Community workplace exposure limit. | Flam. Gas 1: H220; Press. Gas: H280; -: EUH044 | 30.000% |
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Section 4: First aid measures

4.1. Description of first aid measures

- Skin contact:** * Rapid evaporation of liquid may cause frostbite. Thaw frosted parts with lukewarm water. Do not rub affected area. Remove all contaminated clothes and footwear immediately unless stuck to skin. Drench the affected skin with running water for 10 minutes or longer if substance is still on skin. Do not use hot water. If frostbite has occurred call a physician.
- Eye contact:** * Remove contact lenses if present and easy to do so. Bathe the eye with running water for 15 minutes. Consult a doctor.
- Ingestion:** * Ingestion is unlikely due to its physical properties and is not expected to be dangerous. Since this product is a gas, refer to the inhalation section.
- Inhalation:** Remove casualty from exposure ensuring one's own safety whilst doing so. If unconscious, check for breathing and apply artificial respiration if necessary. Consult a doctor.

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

- Skin contact:** There may be redness or whiteness of the skin in the area of exposure. Frost-bite may occur causing the affected area to become white and numb.
- Eye contact:** There may be severe pain. Corneal burns may occur. May cause permanent damage.
- Ingestion:** Not applicable.

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Inhalation: Inhalation may produce the following symptoms: Shortness of breath, dizziness, weakness, nausea, headache, narcosis, irregular cardiac activity. asphyxia May cause cardiac arrhythmia.

Delayed / immediate effects: May cause cardiac arrhythmia.

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

Immediate / special treatment: Do Not give adrenaline or similar drugs.

Section 5: Fire-fighting measures

5.1. Extinguishing media

Extinguishing media: The product is not flammable. Alcohol resistant foam. Water spray. Carbon dioxide. Dry chemical powder. Suitable extinguishing media for the surrounding fire should be used. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes. Pressure build up. Fire or intense heat may cause violent rupture of packages. Non flammable gas.

5.3. Advice for fire-fighters

Advice for fire-fighters: Wear self-contained breathing apparatus. Wear protective clothing to prevent contact with skin and eyes.

Section 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Personal precautions: Refer to section 8 of SDS for personal protection details. Ventilate the area, especially low or enclosed places where heavy vapours might collect. If outside keep bystanders upwind and away from danger point. Vapours heavier than air and can cause suffocation by reducing oxygen available for breathing.

6.2. Environmental precautions

Environmental precautions: Stop release if safe to do so. Prevent from entering sewers, basements and work pits, or any place where the accumulation can be dangerous.

6.3. Methods and material for containment and cleaning up

Clean-up procedures: Material evaporates. Ventilate the area, especially low or enclosed places where heavy vapours might collect.

6.4. Reference to other sections

Reference to other sections: Refer to section 8 of SDS.

Section 7: Handling and storage

7.1. Precautions for safe handling

Handling requirements: Ensure there is sufficient ventilation of the area. Avoid the formation or spread of mists in the air.

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7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Store in a cool, well ventilated area. Keep container tightly closed. Store at a temperature not exceeding 45°C.

Suitable packaging: Must only be kept in original packaging.

7.3. Specific end use(s)

Specific end use(s): No data available.

Section 8: Exposure controls/personal protection

8.1. Control parameters

Hazardous ingredients:

REFRIGERANT R134A

Workplace exposure limits:

Respirable dust

| State | 8 hour TWA | 15 min. STEL | 8 hour TWA | 15 min. STEL |
|-------|------------------------|--------------|------------|--------------|
| EU | 4240 mg/m ³ | - | - | - |

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| EU | 1000 ppm | - | - | - |
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| UK | 1000 ppm | - | - | - |
|----|----------|---|---|---|

DNEL/PNEC Values

Hazardous ingredients:

REFRIGERANT R134A

| Type | Exposure | Value | Population | Effect |
|------|------------------------------------|-------------------------|------------|----------|
| DNEL | Inhalation | 2476 mg/m ³ | Workers | Systemic |
| DNEL | Inhalation | 2476 mg/m ³ | Consumers | Systemic |
| PNEC | Fresh water | 0.01 mg/l | - | - |
| PNEC | Marine water | 0.75 mg/l | - | - |
| PNEC | Microorganisms in sewage treatment | 73 mg/l | - | - |
| DNEL | Inhalation | 13936 mg/m ³ | Workers | Systemic |
| PNEC | Fresh water sediments | 0.75 mg/kg | - | - |

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| Type | Exposure | Value | Population | Effect |
|------|------------|-------------------------|------------|----------|
| DNEL | Inhalation | 16444 mg/m ³ | Workers | Systemic |
| DNEL | Inhalation | 1753 mg/m ³ | Consumers | Systemic |

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|------|-----------------------|-----------|---|---|
| PNEC | Fresh water | 0.1 mg/l | - | - |
| PNEC | Fresh water sediments | 0.6 mg/kg | - | - |

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| Type | Exposure | Value | Population | Effect |
|------|--------------------------------|-------------------------|------------|----------|
| DNEL | Inhalation (developmental tox) | 13936 mg/m ³ | Workers | Systemic |
| DNEL | Inhalation (developmental tox) | 2476 mg/m ³ | Consumers | Systemic |
| PNEC | Fresh water | 0.142 mg/l | - | - |
| PNEC | Fresh water sediments | 0.534 mg/kg | - | - |

8.2. Exposure controls

Engineering measures: Ensure there is sufficient ventilation of the area. Use only in closed systems.

Respiratory protection: Self-contained breathing apparatus must be available in case of emergency. Vapours are heavier than air and can cause suffocation by reducing the oxygen available for breathing.

Hand protection: * Protective gloves. The suitability for a specific workplace should be discussed with the producers of the protective gloves.

Eye protection: Safety glasses with side-shields. Safety goggles. Face-shield. Safety glasses.

Skin protection: Protective clothing.

Section 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

State: Liquified gas

Colour: Colourless

Odour: Characteristic odour

Evaporation rate: No data available.

Oxidising: Not applicable.

Solubility in water: Insoluble

Also soluble in: Most organic solvents.

Boiling point/range°C: -45.5

Melting point/range°C: No data available.

Flammability limits %: lower: Not applicable.

upper: Not applicable.

Flash point°C: Not applicable.

Vapour pressure: 10.999 Bar at 20°C

9.2. Other information

Other information: R407F Liquid Density: 1159 kg/m³ at 20 deg. C R407F Vapour density; 4.629 kg/m³ at boiling point. R407F Molecular weight: 86.20 g/mole

Section 10: Stability and reactivity

10.1. Reactivity

Reactivity: Stable under recommended transport or storage conditions.

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10.2. Chemical stability

Chemical stability: Stable under normal conditions. Stable at room temperature.

10.3. Possibility of hazardous reactions

Hazardous reactions: Hazardous reactions will not occur under normal transport or storage conditions.
Decomposition may occur on exposure to conditions or materials listed below.

10.4. Conditions to avoid

Conditions to avoid: Heat. Hot surfaces. Sources of ignition. Flames.

10.5. Incompatible materials

Materials to avoid: Strong oxidising agents. Strong acids.

10.6. Hazardous decomposition products

Haz. decomp. products: In combustion emits toxic fumes.

Section 11: Toxicological information

11.1. Information on toxicological effects

Hazardous ingredients:

REFRIGERANT R134A

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|-------|-----|---------|--------|------|
| GASES | RAT | 4H LC50 | 567000 | ppmV |
|-------|-----|---------|--------|------|

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|-------|-----|---------|--------|------|
| GASES | RAT | 4H LC50 | 800000 | ppmV |
|-------|-----|---------|--------|------|

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|-------|-----|------|--------|------|
| GASES | RAT | LD50 | 520000 | ppmV |
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Toxicity values: No data available.

Symptoms / routes of exposure

Skin contact: There may be redness or whiteness of the skin in the area of exposure. Frost-bite may occur causing the affected area to become white and numb.

Eye contact: There may be severe pain. Corneal burns may occur. May cause permanent damage.

Ingestion: Not applicable.

Inhalation: Inhalation may produce the following symptoms: Shortness of breath, dizziness, weakness, nausea, headache, narcosis, irregular cardiac activity. asphyxia May cause cardiac arrhythmia.

Delayed / immediate effects: May cause cardiac arrhythmia.

Section 12: Ecological information

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12.1. Toxicity

Hazardous ingredients:

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|--|-----------|-----|------|
| Daphnia magna | 48H EC50 | 980 | mg/l |
| GREEN ALGA (Selenastrum capricornutum) | 72H ErC50 | 118 | mg/l |
| RAINBOW TROUT (Oncorhynchus mykiss) | 96H LC50 | 450 | mg/l |

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|---------------|-----------|-------|------|
| ALGAE | 96H ErC50 | 142 | mg/l |
| Daphnia magna | 48H EC50 | 652 | mg/l |
| FISH | 96H LC50 | 1.057 | mg/l |

12.2. Persistence and degradability

Persistence and degradability: Biodegradable.

12.3. Bioaccumulative potential

Bioaccumulative potential: No bioaccumulation potential.

12.4. Mobility in soil

Mobility: Readily absorbed into soil.

12.5. Results of PBT and vPvB assessment

PBT identification: This product is not identified as a PBT/vPvB substance.

12.6. Other adverse effects

Other adverse effects: Ozone Depletion Potential (ODP): 0 (R11 = 1) R407F Global Warming Potential (GWP): 1825 (CO₂=1) Contains fluoronated greenhouse gases covered by the Kyoto Protocol.

Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Product evaporates.

Recovery operations: Consult manufacturer or supplier for information regarding recovery and recycling of the product. If recovery is not possible, incinerate at a licensed installation.

Waste code number: 14 06 01

Disposal of packaging: Return to supplier.

NB: 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: UN3163

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14.2. UN proper shipping name

Shipping name: LIQUEFIED GAS, N.O.S.
(NORFLUANE; PENTAFLUOROETHANE; DIFLUOROMETHANE)

14.3. Transport hazard class(es)

Transport class: 2

14.4. Packing group

14.5. Environmental hazards

Environmentally hazardous: No

Marine pollutant: No

14.6. Special precautions for user

Special precautions: No special precautions.

Tunnel code: C/E

Transport category: 3

Section 15: Regulatory information

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

Specific regulations: Contains fluorinated greenhouse gases covered by the Kyoto Protocol.

15.2. Chemical Safety Assessment

Chemical safety assessment: A chemical safety assessment has not been carried out for the substance or the mixture by the supplier.

Section 16: Other information

Other information

Other information: This safety data sheet is prepared in accordance with Commission Regulation (EU) No 2015/830.

* indicates text in the SDS which has changed since the last revision.

Phrases used in s.2 and s.3: EUH044: Risk of explosion if heated under confinement.

H220: Extremely flammable gas.

H280: Contains gas under pressure; may explode if heated.

Legal disclaimer: The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. This company shall not be held liable for any damage resulting from handling or from contact with the above product.