

Section 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier****Product name:** REFRIGERANT R442A**Product code:** R442A**Synonyms:** REFRIGERANT RS-50**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
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**Precautionary statements:** P403: Store in a well-ventilated place.

P410: Protect from sunlight.

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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:

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

EINECS	CAS	PBT / WEL	CLP Classification	Percent
206-557-8	354-33-6	Substance with a Community workplace exposure limit.	Press. Gas: H280	31.000%

DIFLUOROMETHANE

200-839-4	75-10-5	Substance with a Community workplace exposure limit.	Flam. Gas 1: H220; Press. Gas: H280	31.000%
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1,1,1,2-TETRAFLUOROETHANE - REACH registered number(s): 01-2119459374-33

212-377-0	811-97-2	Substance with a Community workplace exposure limit.	Press. Gas: H280	30.000%
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1,1-DIFLUOROETHANE - REACH registered number(s): 01-2119474440-43

200-866-1	75-37-6	Substance with a Community workplace exposure limit.	Flam. Gas 1: H220; Press. Gas: H280	5.000%
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HEPTAFLUOROPROPANE - REACH registered number(s): 01-2119485489-18

207-079-2	431-89-0	Substance with a Community workplace exposure limit.	Press. Gas: H280	3.000%
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Section 4: First aid measures

4.1. Description of first aid measures

Skin contact: 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: Bathe the eye with running water for 15 minutes. Transfer to hospital for specialist examination.

Ingestion: Not applicable.

Inhalation: Remove casualty from exposure ensuring one's own safety whilst doing so. If conscious, ensure the casualty sits or lies down. If unconscious and breathing is OK, place in the recovery position. Consult a doctor.

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

Skin contact: There may be mild irritation at the site of contact. Frost-bite may occur causing the affected area to become white and numb.

Eye contact: There may be irritation and redness. There may be severe pain. May cause permanent damage.

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Ingestion: Not applicable.

Inhalation: Gas reduces oxygen available for breathing. Inhalation may produce the following symptoms: Shortness of breath, dizziness, weakness, nausea, headache, narcosis, irregular cardiac activity. The victim will not realize that he/she is suffocating.

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: Suitable extinguishing media for the surrounding fire should be used. Alcohol resistant foam. Carbon dioxide. Water spray. Dry chemical powder. Use water spray to cool containers.

5.2. Special hazards arising from the substance or mixture

Exposure hazards: In combustion emits toxic fumes of hydrogen fluoride.

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. Turn leaking containers leak-side up to prevent the escape of liquid.

6.2. Environmental precautions

Environmental precautions: The product evaporates readily. Prevent from entering sewers, basements and work pits, or any place where the accumulation can be dangerous. Should not be released into the environment.

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. Ensure there is exhaust ventilation of the area. Do not handle in a confined space.

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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.

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:

PENTAFLUOROETHANE

Workplace exposure limits:

Respirable dust

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

DIFLUOROMETHANE

UK	1000 ppm	-	-	-
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1,1,1,2-TETRAFLUOROETHANE

EU	4240 mg/m ³	-	-	-
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1,1-DIFLUOROETHANE

EU	1000 PPM	-	-	-
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HEPTAFLUOROPROPANE

EU	1000 ppm	-	-	-
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DNEL/PNEC Values

Hazardous ingredients:

PENTAFLUOROETHANE

Type	Exposure	Value	Population	Effect
DNEL	Inhalation	16444 mg/m ³	Workers	Systemic
DNEL	Inhalation	1753 mg/m ³	Consumers	Systemic
PNEC	Fresh water	0.1 mg/l	-	-
PNEC	Fresh water sediments	0.6 mg/kg	-	-

DIFLUOROMETHANE

Type	Exposure	Value	Population	Effect
DNEL	Inhalation (developmental tox)	16444 mg/m ³	Workers	Systemic
DNEL	Inhalation (developmental tox)	1753 mg/m ³	Consumers	Systemic

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1,1,1,2-TETRAFLUOROETHANE

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	-	-

1,1-DIFLUOROETHANE

Type	Exposure	Value	Population	Effect
DNEL	Inhalation	2713 mg/m ³	Workers	Systemic
PNEC	Fresh water	0.048mg/l	-	-
PNEC	Marine water	0.0048 mg/l	-	-
PNEC	Fresh water sediments	0.19 mg/l	-	-
PNEC	Marine sediments	0.019 mg/l	-	-
PNEC	Soil (agricultural)	0.141 mg/l	-	-

8.2. Exposure controls

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

Respiratory protection: Respiratory protection not required. Self-contained breathing apparatus must be available in case of emergency.

Hand protection: Protective gloves.

Eye protection: Safety glasses. Ensure eye bath is to hand.

Skin protection: Protective clothing.

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: Liquified gas

Colour: Colourless

Odour: Characteristic odour

Boiling point/range°C: -46.5

Vapour pressure: 13.3 bar at 25°C

Relative density: 1.108 gm/cm³

9.2. Other information

Other information: No data available.

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.

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. Direct sunlight.

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:

PENTAFLUOROETHANE

GASES	RAT	4H LC50	800000	ppmV
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DIFLUOROMETHANE

GASES	RAT	LD50	520000	ppmV
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1,1,1,2-TETRAFLUOROETHANE

GASES	RAT	4H LC50	567000	ppmV
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1,1-DIFLUOROETHANE

GASES	RAT	4H LC50	437500	ppmV
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HEPTAFLUOROPROPANE

GASES	RAT	4H LC50	>788696	ppmV
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Toxicity values: No data available.

Symptoms / routes of exposure

Skin contact: There may be mild irritation at the site of contact. Frost-bite may occur causing the affected area to become white and numb.

Eye contact: There may be irritation and redness. There may be severe pain. May cause permanent damage.

Ingestion: Not applicable.

Inhalation: Gas reduces oxygen available for breathing. Inhalation may produce the following symptoms:

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Shortness of breath, dizziness, weakness, nausea, headache, narcosis, irregular cardiac activity. The victim will not realize that he/she is suffocating.

Delayed / immediate effects: May cause cardiac arrhythmia.

Section 12: Ecological information

12.1. Toxicity

Hazardous ingredients:

DIFLUOROMETHANE

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

1,1,1,2-TETRAFLUOROETHANE

ALGAE	72H ErC50	118	mg/l
Daphnia magna	48H EC50	980	mg/l
RAINBOW TROUT (Oncorhynchus mykiss)	96H LC50	450	mg/l

1,1-DIFLUOROETHANE

Daphnia magna	48H EC50	146695	-
FISH	96H LC50	295783	mg/l

HEPTAFLUOROPROPANE

Daphnia magna	48H EC50	>200	mg/l
GREEN ALGA (Selenastrum capricornutum)	72H ErC50	>114	mg/l
ZEBRAFISH (Brachydanio rerio)	96H LC50	>200	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) Contains fluoronated greenhouse gases covered by the Kyoto Protocol. R442A Global Warming Potential (GWP)=1888 (CO2=1)

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Section 13: Disposal considerations

13.1. Waste treatment methods

Disposal operations: Product evaporates. Recover to a recovery cylinder and return to a refrigerant recovery facility.

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

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: UN1078

14.2. UN proper shipping name

Shipping name: REFRIGERANT GAS, N.O.S.
(PENTAFLUOROETHANE; 1,1,1,2-TETRAFLUOROETHANE; 1,1-DIFLUOROETHANE)

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: Not applicable.

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

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

Phrases used in s.2 and s.3: 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.