

**Section 1: Identification of the substance/mixture and of the company/undertaking****1.1. Product identifier****Product name:** REFRIGERANT R450A**Product code:** R450A**Synonyms:** SOLSTICE N13**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](mailto: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:** P260: Do not breathe vapours.

P280: Wear protective gloves/protective clothing/eye protection/face protection.

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P284: [In case of inadequate ventilation] wear respiratory protection.

P308+313: IF exposed or concerned: Get medical advice/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 R1234ZE - REACH registered number(s): 01-0000019758-54

EINECS	CAS	PBT / WEL	CLP Classification	Percent
471-480-0	29118-24-9	Substance with a Community workplace exposure limit.	Press. Gas: H280	58.000%

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	42.000%
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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 severe pain.

**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. The victim will not realize that he/she is suffocating.

**Delayed / immediate effects:** No data available.

[cont...]

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

**Immediate / special treatment:** Do not give drugs from adrenaline-ephedrine group.

## Section 5: Fire-fighting measures

### 5.1. Extinguishing media

**Extinguishing media:** Suitable extinguishing media for the surrounding fire should be used. Water spray. Carbon dioxide. Alcohol resistant foam. 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. Stop release if safe to do so. 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.

### 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.

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## 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 R1234ZE

Workplace exposure limits:

Respirable dust

State	8 hour TWA	15 min. STEL	8 hour TWA	15 min. STEL
UK	800 ppm	-	-	-

1,1,1,2-TETRAFLUOROETHANE

EU	4240 mg/m <sup>3</sup>	-	-	-
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### DNEL/PNEC Values

Hazardous ingredients:

REFRIGERANT R1234ZE

Type	Exposure	Value	Population	Effect
DNEL	Inhalation	3902 mg/m <sup>3</sup>	Workers	Systemic
DNEL	Inhalation	830 mg/m <sup>3</sup>	Consumers	Systemic

1,1,1,2-TETRAFLUOROETHANE

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

### 8.2. Exposure controls

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

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

**Hand protection:** Material: Leather gloves. Material: Low temperature resistant gloves. The suitability for a specific workplace should be discussed with the producers of the protective gloves.

**Eye protection:** Ensure eye bath is to hand. Safety glasses with side-shields.

**Skin protection:** Protective clothing.

**Environmental:** Gas escapes to be kept to the minimum by engineering processes and operating methods.

[cont...]

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## Section 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

**State:** Liquified gas

**Colour:** Colourless

**Odour:** Barely perceptible odour

**Boiling point/range°C:** -23.1

**Flash point°C:** Not applicable.

**Vapour pressure:** 584 kPa at 25oC

**Relative density:** 1175.1 kg/m3

### 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.

### 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. Direct sunlight.

### 10.5. Incompatible materials

**Materials to avoid:** Finely powdered metals. Strong oxidising agents. Strong acids. Aluminium. Magnesium. Zinc.

### 10.6. Hazardous decomposition products

**Haz. decomp. products:** In combustion emits toxic fumes of hydrogen fluoride.

## Section 11: Toxicological information

### 11.1. Information on toxicological effects

**Hazardous ingredients:**

**1,1,1,2-TETRAFLUOROETHANE**

GASES	RAT	4H LC50	567000	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 severe pain.

[cont...]

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**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. The victim will not realize that he/she is suffocating.

**Delayed / immediate effects:** No data available.

**Other information:** Not applicable.

## Section 12: Ecological information

### 12.1. Toxicity

**Hazardous ingredients:**

#### 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

### 12.2. Persistence and degradability

**Persistence and degradability:** No data available.

### 12.3. Bioaccumulative potential

**Bioaccumulative potential:** No data available.

### 12.4. Mobility in soil

**Mobility:** No data available.

### 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) R450A Global Warming Potential = 604 (CO<sub>2</sub>=1)

## 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 installation.

**Disposal of packaging:** Return to supplier.

**NB:** The user's attention is drawn to the possible existence of regional or national regulations regarding disposal.

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## Section 14: Transport information

### 14.1. UN number

UN number: UN3163

### 14.2. UN proper shipping name

Shipping name: LIQUEFIED GAS, N.O.S.  
(REFRIGERANT R1234ZE; 1,1,1,2-TETRAFLUOROETHANE)

### 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 2015/830.

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

Phrases used in s.2 and s.3: H280: Contains gas under pressure; may explode if heated.

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