

# SAFETY DATA SHEET

## Refrigerant R1234ze

Version 1.0

Revision Date: 04.03.2013



## SAFETY DATA SHEET REFRIGERANT R1234ZE

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

#### 1.1. Product Identifier

**Product name:** REFRIGERANT R1234ZE  
**EC Number:** 471-480-0  
**REACH Registration Number:** 01-0000019758-54  
**CAS Number:** 29118-24-9

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

**Use:** Refrigerant  
Aerosol propellant  
Foam blowing agent  
**Advised Against:** None

#### 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](mailto:sds@nationalref.com)

#### 1.4. Emergency telephone number

Emergency Tel: +44(0) 1865 407333 (24 hour, English Only)

### SECTION 2: HAZARDS IDENTIFICATION

#### 2.1. Classification of the substance of mixture

**Directives 67/548/EEC or  
1999/45/EC**

**Regulation (EC) 1272/2008**

This substance is not classified as Dangerous to Directive 67/548/EEC  
Gases under pressure Liquefied gas.  
H280: Contains gas under pressure; may explode if heated.

#### 2.2. Label elements

**Regulation (EC) No. 1272/2008**

Hazard pictograms:



Signal word:

Warning

Hazard statements:

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

Precautionary statements:

P281: Use personal protective equipment as required.  
P260: Do not breathe dust/fume/gas/mist/vapours/spray.  
P308 + P313: If exposed or concerned: Get medical advice/attention.  
P410 + P403: Protect from sunlight. Store in a well-ventilated place.

**Directives 67/458/EEC or  
1999/45/EC:**

Not a hazardous substance according to EC-directives 67/548/EEC or 1999/45/EC.  
This product does not need to be labelled in accordance with EC directives or respective national laws.

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### 2.3. Other hazards

- Potential health effects** Skin: Rapid evaporation of the liquid may cause frostbite.  
Eyes: May irritate eyes.  
Ingestion: Unlikely route of exposure.  
Inhalation: Inhalation may cause central nervous system effects.  
Vapours may cause drowsiness and dizziness.  
Chronic Exposure: None known.
- Potential environmental effects** An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

## SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

### 3.1. Substances

- Hazardous Ingredients:**
- |                                |                                      |
|--------------------------------|--------------------------------------|
| Chemical Name:                 | Trans-1,3,3,3-Tetrafluoroprop-1-ene. |
| CAS No.                        | 29118-24-9                           |
| EC No.                         | 471-480-0                            |
| Registration No.               | 01-0000019758-54                     |
| Occupational exposure Limit(s) | See section 8.                       |

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

- General advice:** Show this safety data sheet to the doctor in attendance. Keep patient warm and in a quiet place.
- Skin contact:** Rapid evaporation of the liquid may cause frostbite. If there is evidence of frostbite, bathe (do not rub) with lukewarm (not hot) water. If water is not available, cover with a clean, soft cloth or similar covering. Call a physician if irritation develops or persists.
- Eye contact:** If eye irritation persists, consult a specialist.
- Ingestion:** Not a route of injury.
- Inhalation:** If inhaled, remove to fresh air. Get medical attention if irritation develops and persists.  
See Section 11 for more detailed information on health effects and symptoms.

## SECTION 5: FIRE-FIGHTING MEASURES

- Extinguishing media:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.  
Water Mist  
Dry Powder  
Foam  
Carbon Dioxide (CO<sub>2</sub>)
- Specific hazard during fire fighting:** Heating will cause pressure rise with a risk of bursting.  
Some risk may be expected of corrosive and toxic decomposition products.  
Fire may cause the formation of Hydrogen Fluoride.  
This material can ignite when mixed with air under pressure and exposed to strong ignition sources.
- Special protective equipment for fire-fighters:** Wear full protective clothing and self-contained breathing apparatus.  
Exposure to decomposition products may be hazardous to health.
- Further information:** Use water spray to cool unopened cylinders.

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### SECTION 6: ACCIDENTAL RELEASE MEASURES

#### 6.1. Personal precautions, protective equipment and emergency procedures

**Personal precautions:** Ensure adequate ventilation. Wear personal protective equipment. Unprotected persons must be kept away and upwind of leak/spill. Vapour is heavier than air and can cause suffocation by reducing the oxygen available for breathing.

#### 6.2. Environmental precautions

**Environmental precautions:** Prevent further leakage or spillage if safe to do so. The product evaporates readily. Prevent spreading over wide area by containment or bunding.

#### 6.3. Methods and material for containment and cleaning up

**Clean-up procedures:** Do not direct water spray at the point of leakage. Allow to evaporate and ventilate the area.

#### 6.4. Reference to other sections

**Reference to other sections:** For personal protection see Section 8.

### SECTION 7: HANDLING AND STORAGE

#### 7.1. Handling

**Advice on safe handling:** Pressurised container: protect from sunlight and do not expose to temperatures exceeding 50°C.  
Do not pierce or burn even after use.  
Exhaust ventilation of the equipment area is necessary.

**Advice on protection against fire and explosion:** Do not spray on a naked flame or any incandescent material.  
Keep away from direct sunlight. Fire or intense heat may cause violent rupture of cylinders.  
Vapour may form explosive mixtures with air. The product is not easily combustible.

**Hygiene Measures:** Avoid breathing vapour, mist or gas. Keep working clothes separately.  
Do Not Smoke

#### 7.2. Conditions for safe storage, including any incompatibilities

**Storage conditions:** Keep cylinders tightly closed in a cool, well ventilated place.  
Do not store at a temperature exceeding 50°C.  
Keep away from direct sunlight.  
Do not store together with Oxidising Agents.

**Suitable packaging:** Store in original cylinders only.

#### 7.3. Specific use information

**Specific use information:** Restricted to professional users.  
Refrigerant grade for refrigeration use.  
Foam grade for aerosol & foam blowing use.

### SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

#### 8.1. Control parameters

##### Occupational exposure limits

Components	Basis	Value Type	Control Parameters	Exceeding Factor	Form of Exposure	Remarks
Trans-1,3,3,3-Tetrafluoroprop-1-ene	Honeywell	TWA	800 ppm			We are not aware of any national

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						exposure limit.
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### Occupational Exposure Controls

The Personal Protective Equipment must be in accordance with EN standards: Respirator EN 136, 140, 149; Safety Glasses EN 166; Protective suit EN 340, 463, 468, 943-1, 943-2; Gloves EN 374; Safety Shoes EN-ISO 20345  
The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.  
Avoid inhalation of vapour or mist.

### Environmental Exposure Controls:

Handle with local environmental regulations and good industrial practices.

### Engineering Measures:

Local exhaust ventilation.

### Personal Protective Equipment:

#### **Respiratory Protection**

In case of insufficient ventilation wear suitable respiratory equipment (see above for EN standard).

Wear a positive-pressure supplied-air respirator.

#### **Hand Protection**

Glove material: Viton ®. (see above for EN standard).

Heat insulating gloves

#### **Eye Protection**

Goggles or glasses (see above for EN standard).

#### **Skin and body protection**

Wear suitable protective equipment.

Protective footwear

See above for EN standard.

### DNEL/PNEC- Values

No DNEL data available.

No PNEC data available.

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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

State:	Liquefied gas
Colour:	Colourless
Odour:	Slight ether-like
Boiling Point/range:	-19°C
Flash Point:	Does not flash
Auto-ignition Temperature:	368°C
Upper explosive limit/upper flammability limit:	No data available
Vapour pressure:	10.998 hPa at 20°C
Liquid Density:	1,17 g/cm <sup>3</sup> at 21.1°C
Water solubility:	0.373 g/l
Partition coefficient: n-octanol/water:	Log P <sub>ow</sub> 1.6
Vapour Density (Air = 1)	4.0

## SECTION 10. STABILITY AND REACTIVITY

### 10.1. Chemical stability

**Chemical stability:** Hazardous decomposition products formed under fire conditions. To avoid thermal decomposition, do not overheat.

### 10.2. Conditions to avoid

**Conditions to avoid:** Some risk may be expected of corrosive and toxic decomposition products. Heat, flames and sparks

### 10.3. Incompatible material

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**Materials to avoid:** Reactions with alkali metals.

### 10.4. Hazardous decomposition products

**Hazardous decomposition products** Pyrolysis products containing fluoride  
Fluorocarbons  
Hydrogen Fluoride

### SECTION 11: TOXICOLOGICAL INFORMATION

**Acute oral toxicity:** Not applicable.  
**Acute Dermal toxicity:** No data available.  
**Acute Inhalation Toxicity:** LC<sub>50</sub>  
Species: rat  
Value: > 965 mg/l  
> 207000 ppm  
Exposure time: 4 hours

**Skin Irritation:** Species: rabbit  
Result: no skin irritation  
Method: OECD Test Guideline 404

**Eye Irritation:** No data available

**Sensitisation:** Species: Human  
Classification: Non-Sensitizing

**Further Information:** Not mutagenic in Ames Test. May cause headache and dizziness. No experimental indications on genotoxicity in vivo found. Detailed toxicological data and examinations, exceeding the data set in the SDS are available for professional users on request.

### SECTION 12. ECOLOGICAL INFORMATION

Where sections are blank there is no data available.

#### 12.1. Toxicity

**Toxicity to fish:** NOEC  
Species: Cyprinus carpio (Carp)  
Value: >117 mg/l  
Exposure Time: 96 h

**Toxicity to Aquatic plants:** NOEC  
Growth inhibition  
Species: Algae  
Value: >170 mg/l  
Exposure time: 72 h

**Acute Toxicity to aquatic invertebrates:** EC50  
Species: Daphnia magna (Water flea)  
Value: >160 mg/l  
Exposure time: 48 h

**Ecotoxic values:**

#### 12.2. Persistence and degradability

**Persistence and degradability:** Aerobic  
Result: Not readily biodegradable

#### 12.3. Bio accumulative potential

**Bio-accumulative potential:**

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### 12.4. Mobility in soil

Mobility:

### 12.5. Results of PBT and vPvB assessment

PBT identification:

### 12.6. Other adverse effects

Other adverse effects:

## SECTION 13. DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

**Product:** Dispose according to legal requirements  
Contact manufacturer.

**Packaging:** Legal requirements are to be considered in regard of reuse or disposal of used packaging material.  
Return cylinders to supplier.

**Further Information:** Provisions relating to waste:  
EC Directive 2006/12/EC; 91/689/EEC  
Regulation No. 1013/2006

For personal protective equipment see Section 8.

N.B.

## SECTION 14. TRANSPORT INFORMATION

### 14.1. ADR

**UN Number:** 3163  
**Proper Shipping Name:** LIQUEFIED GAS N.O.S. ( TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)  
**Class/Division:** 2  
**Classification Code:** 2A  
**Tunnel Code:** (C/E)  
**Hazard Identification Number:** 20  
**Labelling ADR:** 2.2  
**Further Information** Environmental Hazard: No

### 14.2. IATA

**UN Number:** 3163  
**Proper Shipping Name:** LIQUEFIED GAS N.O.S. ( TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)  
**Class/Division:** 2.2  
**Hazard labels:** 2.2  
**Further Information**

### 14.3. IMDG

**UN Number:** 3163  
**Proper Shipping Name:** LIQUEFIED GAS N.O.S. ( TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)  
**Class/Division:** 2.2  
**Hazard Labels:** 2.2  
**EmS Number:** F-C, S-V  
**Marine Pollutant:** No

## SECTION 15. REGULATORY INFORMATION

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

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### Other inventory information

US. Toxic Substances Control Act	On TSCA inventory
Australia. Industrial Chemical (Notification and Assessment) Act	Not in compliance with the inventory.
Canada. Canadian Environmental Protection Act (CEPA) Domestic Substances List (DSL)	All components of this product are on the Canadian DSL list
Japan. Kashin-Hou Law List	On the inventory, or in compliance with the inventory.
Korea. Existing Chemicals Inventory (KECI)	Not in compliance with the inventory.
Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act	Not in compliance with the inventory.
China. Inventory of Existing Chemical Substances	On inventory, or in compliance with the inventory.
New Zealand. Inventory of Chemicals (NZIoC) as published by ERMA New Zealand	Not in compliance with the inventory.

### 15.2. Chemical Safety Assessment

Chemical Safety Assessment has not been done by the manufacturer yet.

### 16. OTHER INFORMATION

**Other information:** This safety sheet is prepared in accordance with Commission Regulation (EU) No. 453/2010.  
\* Indicates text in SDS which has changed since the last revision.

**Abbreviations:** EC European Community  
CAS Chemical Abstracts Services

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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