TAZZETTI

SAFETY DATA SHEET (SDS)

SECTION 1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product Identifier
Substance identification:

Name:	R1234ze(E)
CAS Number:	29118-24-9
EC Number:	471-480-0
REACH Number:	01-0000019758-54-0000

1.2. Relevant identified uses of the substance/mixture and uses advised against
Recommended use:
Refrigerant

1.3. Details of the supplier of the safety data sheet
Company:
TAZZETTI S.P.A
CORSO EUROPA 600/A
10088 VOLPIANO (TO) - ITALY-
Tel. +39 02 66101029 (24 h / 24 h)
rsg.inquiry@tazzetti.com

1.4. Emergency telephone number
Regional: +44 20 3885 0382 (CHEMTREC)
USA Local: +1-703-527-3887 (CHEMTREC)

SECTION 2. HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture
EC regulation criteria 1272/2008 (CLP):
Warning, Liquef. Gas, Contains gas under pressure

2.2. Label elements
Symbols:

Signal word: Warning
Hazard statements:
H280 Contains gas under pressure; may explode if heated.
Precautionary statements:
P403 Store in a well ventilated place
P410 Protect from sunlight
Special Provisions:
Contains fluorinated greenhouse gases.

2.3. Other hazards
This substance/mixture does not contain components considered to be both persistent, bioaccumulative

and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at concentrations of 0.1% or higher. ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher. toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to Article 57(f) of REACH or Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
Vapors are heavier than air and can cause suffocation by reducing the oxygen available for breathing. Inappropriate use or abuse by intentional inhalation can result in death without premonitory symptoms, due to cardiac damage.
Rapid evaporation of the product can cause frostbite.
May reduce available oxygen and cause suffocation rapidly.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Substance identification:

Name:	R1234ze
Chemical name:	Trans-1,3,3,3-tetrafluoroprop-1-ene
CAS Number:	29118-24-9
EC Number:	471-480-0
REACH Number:	01-0000019758-54-0000

3.2. Mixtures

Not applicable

SECTION 4. FIRST AID MEASURES

4.1. Description of first aid measures

General information:
The rescuer should equip himself with personal protection. Move away from the danger area. Keep warm in a quiet room. Show this MSDS to the attending physician. Remove all contaminated clothing immediately.
Inhalation: if inhaled, remove to fresh air. Seek medical attention if irritation increases and persists.
Skin contact:
Rapid evaporation of liquid may cause frostbite. If there are signs of frostbite, soak in warm (not hot) water without rubbing. If water is not available, cover with a clean, soft cloth or similar covering. Call a doctor if irritation increases or persists.
Eye contact: Rinse eyes immediately with plenty of water. Call a doctor immediately.
Ingestion: Ingestion is unlikely due to the physical properties and is not thought to be dangerous. Since this product is a gas, refer to the Inhalation Section.

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

No data available

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

No data available
See Section 11 for more detailed information on health effects and symptoms.

SECTION 5. FIRE-FIGHTING MEASURES

5.1. Extinguishing media

Use extinguishing systems that are compatible with the local situation and the surrounding environment.
Aqueous mist
Dry powder

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Foam
Carbon dioxide (CO2)
Extinguishing media not to be used for safety reasons:
Abundant water jet

5.2. Special hazards arising from the substance or mixture
Heat causes increase in pressure with danger of bursting
Particular hazards due to corrosive, toxic fuels and decomposition products.
Combustion can cause fumes of:
Hydrofluoric acid
However, this material can ignite where mixed with pressurized air and exposed to strong sources of combustion.
Vapors are heavier than air and can cause suffocation by reducing the oxygen available for breathing.

5.3. Advice for fire-fighters
Wear full protective clothing and self-contained breathing apparatus.
Inhalation of decomposition products can cause health damage.
Use extinguishing systems compatible with the local situation and surroundings. In case of fire, cool the containers with water jets.

SECTION 6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
Provide adequate ventilation. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid skin contact with escaping liquid (risk of frostbite). Use personal protective equipment. Keep people away from the spill, upwind.

6.2. Environmental precautions
Avoid additional spills or leaks if this can be done safely. The product evaporates quickly. Prevent spraying over a large area (such as through oil barriers or containment areas).

6.3. Methods and material for containment and cleaning up
Do not direct the water jet at the flaw.
Allow it to evaporate

6.4. Reference to other sections
See also section 8 and 13.

SECTION 7. HANDLING AND STORAGE

7.1. Precautions for safe handling
Use only equipment suitable for the product and pressure of use
Take precautions against electrostatic discharge.
Keep away from sources of ignition (including electrostatic charges).
Avoid skin and eye contact, inhalation of vapors and mists.
Use localized ventilation system.
During work do not eat or drink. During work do not smoke.
Also refer to section 8 for recommended protective equipment.
Only experienced and properly trained personnel should handle compressed gases.
The product should be handled in accordance with good safety and industrial hygiene practices.
Purge the 'air from the system before introducing the gas.
Ensure that the entire gas distribution system has been (or is regularly) checked against leaks before use.
Assess the risk of potential explosive atmospheres and the need for explosion-proof equipment.
Assess the need to use only non-sparking equipment.

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Protect cylinders from physical damage; do not drag, roll, slide or drop.
Do not remove or make illegible the labels affixed by the supplier to identify cylinder contents.
If the operator encounters any difficulty while operating the valve discontinue use and contact the supplier.
Close the container valve after each use and when empty, even if still connected to the equipment.
Never attempt to repair or modify container valves or safety devices.
Refit valve and container caps and/or caps, where provided, as soon as the container is disconnected from the equipment.
Do not use direct flames to increase the internal pressure of the container.
Do not use compressed air for filling, unloading or handling. Electrostatic charges may be generated during handling. Electrostatic discharges can cause fires.
Ground all equipment. Discharge lines can reach extremely low temperatures resulting in a risk of cold burns.
Containers, even those that have been emptied, may contain explosive vapors. Do not cut, drill, grind, weld or perform other similar operations on or near containers.

7.2. Conditions for safe storage, including any incompatibilities
Observe all regulations and local requirements regarding storage of containers.
Keep container in a well ventilated place.
Protect cylinders from physical damage; do not drag, roll, slide or drop.
Keep away from open flames, sparks and heat sources.
Keep container below 50 °C.
Containers should not be stored in conditions likely to encourage corrosion.
Incompatible materials:
See paragraph 10 below.
Instructions as regards storage permises:
Adequately ventilated.

7.3. Specific end use(s)
If annexed, please make reference to the scenario

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters
Occupational exposure limits trans-1,3,3,3-Tetrafluoroprop-1-ene HONEYWELL TWA 800 ppm
DNEL value
trans-1,3,3,3- Tetrafluoroprop-1-ene Workers/Long-term systemic effects 3902 mg/m3 Inhalation
trans-1,3,3,3- Tetrafluoroprop-1-ene Consumers/Long-term systemic effects 830 mg/m3 Inhalation
PNEC value
trans-1,3,3,3-Tetrafluoroprop-1-ene Fresh water: 0.1 mg/l Assessment factor: 1000

8.2. Exposure controls
The product should be handled in a closed circuit..
Provide adequate general and local ventilation.
Make sure the exposure is well below the occupational exposure limits.
If the risk assessment indicates this is necessary, use the following protection
Eye protection:
If foreseeable a risk of spurts or squirts, please wear safety glasses with lateral protection in compliance with rule of law EN 166.
Protection for skin:
Protective clothing
Protection for hands:
If foreseeable a direct contact with liquid or with cold machineries/equipments for which exist a risk of cold burn, please use cold protection gloves in compliance with rule of law EN511 – 020.
Respiratory protection:

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Wear self-contained breathing apparatus in compliance with EN 137 when entering area unless atmosphere is proved to be safe.
Thermal Hazards:
Contact with liquid may cause cold burns/frostbite.
Environmental exposure controls:
Refer to environment legislation
Contact with liquid may cause cold burns/frostbite.
In high concentrations may cause asphyxiation.
Vapour heavier than air, may accumulate below ground level and cause choking.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Appearance:	Gas
Colour:	Incolour
Odour:	Ethereal
pH:	Not applicable to substance
Melting point / freezing point:	Information non available
Initial boiling point and boiling range:	-19 °C at 1013 hPa
Solid/gas flammability:	Not applicable to substance
Upper/lower flammability or explosive limits:	Not applicable to substance
Density:	1.17 g/cm3 at 21.1 °C
Relative vapor density:	4 (Air = 1.0)
Vapor density:	1.17 g/cm3 at 21.1 °C
Flash point:	Not applicable to substance
Evaporation rate:	Not tested
Vapour pressure:	4271 hPa (at 20 °C) 11152 hPa (at 54,4 °C)
Solubility in water:	0,373 g/l
Partition coefficient n-octanol/water (POW):	1.6
Auto-ignition temperature:	368 °C
Particle characteristics :	No data available

9.2. Other information

Oxidizing properties :	The substance or mixture is not classified as an oxidant
Evaporation rate :	No data available
Viscosity, dynamic :	No data available

SECTION 10. STABILITY AND REACTIVITY

10.1. Reactivity
The product is stable in normal conditions

10.2. Chemical stability
Hazardous decomposition products in case of fire. To avoid thermal decomposition, do not overheat.

10.3. Possibility of hazardous reactions
Can react violently if in contact with alkali metals, alkaline earth metals.

10.4. Conditions to avoid
Avoid all possible sources of ignition (spark or flame). Do not cut, drill, grind or expose containers to heat.

10.5. Incompatible materials
Finely divided metals, magnesium and alloys containing more than 2% magnesium, powdered metal salts.

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10.6. Hazardous decomposition products
Hydrogen fluoride by thermal decomposition and hydrolysis, carbon oxides, carbonyl fluoride, fluorocarbons.

SECTION 11. TOXICOLOGICAL INFORMATION

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008
Acute toxicity
Acute oral toxicity: Not applicable study technically not feasible
Acute dermal toxicity: No data available study technically not feasible
Acute inhalation toxicity: LC0 Species: Rat Value: > 207000 ppm Exposure time: 4 h Method: OECD Test Guideline 403 Acute toxicity (other routes of administration): No data available
Skin corrosion/irritation: Species: Rabbit Result: No skin irritation Method: OECD Test Guideline 404
Serious eye damage/eye irritation: No data available study technically not feasible
Respiratory or skin sensitisation: Species: human Result: Does not cause skin sensitisation.
Germ cell mutagenicity: Test Method: Chromosome aberration test in vitro Cell type: Human lymphocytes Result: negative Method: OECD Test Guideline 473 Test Method: Ames test Result: negative Test Method: Mutagenicity (in vivo mammalian bone-marrow cytogenetic test, chromosomal analysis) Species: Mouse Cell type: Micronucleus Application Route: Inhalation Method: OECD Test Guideline 474 Result: negative
Carcinogenicity: Note: No data available
Reproductive toxicity: Test Type: Two-generation study Method: OECD Test Guideline 416 Species: Rat Route of Application: Inhalation General Toxicity - Parent: NOEL: > 20.000 ppm General Toxicity F1: NOEL: > 20.000 ppm Method: OECD Test Guideline 414 Species: Rat Route of Application: Inhalation General Toxicity Maternal: NOEC: 15.000 ppm Developmental Toxicity: NOAEC: 15.000 ppm
STOT-single exposure: No data available
STOT - repeated exposure: Species: Rat Application Route: Inhalation Exposure time: 90 d NOEL: 5000 Method: OECD Test Guideline 413 Note: Subchronic toxicity
Aspiration hazard: No data available

11.2. Information on other hazards
Endocrine disrupting properties no data available
Other information: Cardiac sensitization (dog): no effect

SECTION 12. ECOLOGICAL INFORMATION

12.1. Toxicity
Fish toxicity: CL0 Static test Species: Cyprinus carpio (Carp) Value: > 117 mg/l Exposure time: 96 h Method: OECD TG 203
Aquatic plant toxicity: NOEC Growth rate Species: Algae Value: > 170 mg/l Exposure time: 72 h Method: OECD Test Guideline 201.
NOEC Biomass Species: Algae Value: > 170 mg/l Exposure time: 72 h Method: OECD Test Guideline 201
Aquatic invertebrate toxicity: EC50 Static test Species: Daphnia magna (Large water flea) Value: > 160 mg/l Exposure time: 48 h Method: OECD Test Guideline 202

12.2. Persistence and degradability
Biodegradability: aerobic Result: Not readily biodegradable.

12.3. Bioaccumulative potential
No bioaccumulation is to be expected (log Pow <= 4).

12.4. Mobility in soil
No data available

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12.5. Results of PBT and vPvB assessment
Substance is not persistent, bioaccumulative, and toxic (PBT).
Substance is not very persistent and very bioaccumulative (vPvB)

12.6. Other adverse effects
No data available

12.7 Other adverse effects
No data available

SECTION 13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Recover if possible. Send to licensed disposal facilities or incineration under controlled conditions. Operate in accordance with current local and national regulations.
Do not discharge into areas with risk of forming explosive atmospheres with air. Gas should be disposed of in appropriate flare with flame arrestor.
Contact the supplier if instructions are deemed necessary.
After emptying the containers ventilate them in a safe environment away from sparks or flames. Residue can be an explosion hazard. Do not puncture, cut or weld uncleaned containers.
Do not disperse in the environment

SECTION 14. TRANSPORT INFORMATION

14.1. UN number
ADR/RID/IMDG/IATA - UN number: 3163
In case the substance is inside a refrigerating machine is applied the following UN number: 2857

14.2. UN proper shipping name
ADR/RID/IMDG-Dispatch name: Liquefied gas n.o.s. (TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)
IATA-Technical name: Liquefied gas n.o.s. (TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)
In case the substance is inside a refrigerating machine the shipping name will be: REFRIGERATING MACHINES containing non-fiammable, no-toxic, gases or ammonia solutions (N°ONU 2672)

14.3. Transport hazard class(es)
ADR/RID-Class: 2
ADR-Label: 2.2
RID-Label: 2.2 (+13)
ADR/RID - Hazard identification number: 20
Classification code: 2A
IATA/IMDG - Class: 2.2

14.4. Packing Group
ADR/IMDG - Packing Group: -

14.5. Environmental hazards: No

14.6. Special Precautions for User
ADR-Tunnel restriction code: C/E
IMDG stowage and segregation : Cat. A
IMDG Emergency schedules : F-C, S-V
Ensure there is adequate ventilation
Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency.

Compliance with applicable regulations.
Before transporting product containers :
- Ensure that containers are firmly secured.
- Ensure cylinder valve is closed and not leaking.
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
- Ensure valve protection device (where provided) is correctly fitted.
Avoid transport on vehicles where the load space is not separated from the driver's compartment.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable

SECTION 15. REGULATORY INFORMATION

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

Legislative Decree 81/2008; Regulation (EC) No. 1907/2006 (REACH), Regulation (EC) No. 1272/2008 (CLP), Regulation (EU) No. 2015/830, Regulation (EU) 2020/878.
Where applicable, refer to the following regulatory provisions :
Directive 2003/105/CE ('Activities linked to risks of serious accidents') and subsequent amendments.
1999/13/EC (VOC directive)

15.2. Chemical Safety Assessment: No

SECTION 16. OTHER INFORMATION

Safety Data Sheet revised in accordance with EU Regulation 2020/878.
Points that have changed from the previous version are highlighted with a vertical line in the body of this document.
Ensure operators understand the flammability hazard.
Users of breathing apparatus must be trained.
Ensure operators understand the toxicity hazard.
This document was prepared by a competent person who has received appropriate training.
Main bibliographic sources:
ECHA: European chemical agency
ECDIN - Environmental Chemicals Data and Information Network - Joint Research Centre, Commission of the European Communities
SAX's DANGEROUS PROPERTIES OF INDUSTRIAL MATERIALS - Eight Edition - Van Nostrand Reinold
CCNL - Appendix 1
EIGA
The information contained herein is based on our state of knowledge at the above-specified date. It refers solely to the product indicated and constitutes no guarantee of particular quality.
It is the duty of the user to ensure that this information is appropriate and complete with respect to the specific use intended.
Classification in accordance with calculation methods of regulation (EC) 1272/2008 CLP / (EC) 1999/45 DPD. The MSDS cancels and replaces any preceding release.

ADR:	European Agreement concerning the International Carriage of Dangerous Goods by Road.
CAS:	Chemical Abstracts Service (division of the American Chemical Society).
CLP:	Classification, Labeling, Packaging..
DNEL:	Derived No Effect Level.
EINECS:	European Inventory of Existing Commercial Chemical Substances.
GHS:	Globally Harmonized System of Classification and Labeling of Chemicals.
IATA:	International Air Transport Association.

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IATA-DGR:	Dangerous Goods Regulation by the "International Air Transport Association" (IATA).
ICAO:	International Civil Aviation Organization.
ICAO-TI:	Technical Instructions by the "International Civil Aviation Organization" (ICAO).
IMDG:	International Maritime Code for Dangerous Goods.
LC50:	Lethal concentration, for 50 percent of test population.
LD50:	Lethal dose, for 50 percent of test population.
LTE:	Long-term exposure.
PNEC:	Predicted No Effect Concentration.
RID:	Regulation Concerning the International Transport of Dangerous Goods by Rail.
STE:	Short-term exposure.
STEL:	Short Term Exposure limit.
STOT:	Specific Target Organ Toxicity.
TLV:	Threshold Limiting Value.
TWATLV:	Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).

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