

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form	: Substance
Name	: Solstice® ze (R-1234ze)
Chemical name	: Trans-1,3,3,3-Tetrafluoroprop-1-ene
EC-No.	: 471-480-0
CAS-No.	: 29118-24-9
REACH registration No	: 01-0000019758-54
Product code	: 101123400

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

1.2.1. Relevant identified uses

Use of the substance/mixture : Refrigerant

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Supplier

Dehon Service SAS
 26 Avenue du Petit Parc
 94683 VINCENNES Cedex - France
 T 01 43 98 75 00 - F 01 43 98 21 51
ContactFDS@climalife.dehon.com

Other

Climalife Kft Budepesta sucursalca Bucuresti Romania
 Bulevardul Hristo Botev, Nr. 28,
 Biroul NR 4, Modulul I
 Bucuresti Sectorul 3 - Romania
ContactFDS@climalife.dehon.com

Other

Dehon Kälte-Fachvertriebs GmbH
 Robert-Bosch-Strasse 14
 40668 MEERBUSCH - Germany
 T 00 49 2150 7073 0 - F 00 49 2150 7073 17
ContactFDS@climalife.dehon.com

Other

Dehon Service Belgium s.a/n.v.
 Avenue Carton de Wiart, 79
 1090 Bruxelles - Belgium
 T 00 32 2 421 01 70 - F 00 32 2 426 96 62
ContactFDS@climalife.dehon.com

Other

Friogas sa
 Poligono Industrial SEPES
 Parcela 10
 46500 SAGUNTO (Valencia) - Spain
 T 00 34 9 6 266 36 32 - F 00 34 9 6 266 50 25
ContactFDS@climalife.dehon.com

Other

Prochimac SA
 Rue du Château 10
 CH-2000 NEUCHÂTEL - Switzerland
 T 00 41 32 727 36 00 - F 00 41 32 727 36 19
ContactFDS@climalife.dehon.com

Other

Climalife Hongrie Kft
 Villányi út 47
 1118 Budaörs - Hungary
 T (36) 23 431 660 - F (36) 23 431 661
ContactFDS@climalife.dehon.com

Other

Climalife Supplied by Inventec Performance Chemicals Italia SRL
 Via del Lavoro, 10/G
 20874 Busnago MB - Italia
 T +39 39-5973480 - F +39 39-5973490
ContactFDS@climalife.dehon.com

Other

Dehon nordic service
 Östra Hamngatan 50B 3tr
 41109 GÖTEBORG - Sweden
 T 00 46 44 21 58 80 - F 00 46 44 21 58 80
ContactFDS@climalife.dehon.com

Other

Dehon Service Nerderland B.V.
 Van Konijnenburgweg 84
 NL-4612 PL Bergen Op Zoom - Netherlands
 T 00 31 164 212 830 - F 00 31 164 212 831
ContactFDS@climalife.dehon.com

Other

IDS Refrigeration Limited
 22 Apex Court, Woodlands, Bradley Stoke
 BS32 4JT Bristol - United Kingdom
 T 00 44 1179 802520 - F 00 44 1179 802521
ContactFDS@climalife.dehon.com

Solstice® ze (R-1234ze)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

1.4. Emergency telephone number

Emergency number : +33 (0) 1 72 11 00 03

Country	Organisation/Company	Address	Emergency number	Comment
United Kingdom	National Poisons Information Service (Birmingham Centre) City Hospital	Dudley Road B18 7QH Birmingham	0344 892 0111	

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Press. Gas (Liq.) H280

Full text of hazard classes and H-statements : see section 16

Adverse physicochemical, human health and environmental effects

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Contact with the liquid may cause frostbite and serious damage to eyes. Under certain temperature and pressure conditions may form a flammable mixture in the presence of air.

2.2. Label elements

Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP) :



GHS04

Signal word (CLP) :

Warning

Hazard statements (CLP) :

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

Precautionary statements (CLP) :

P410+P403 - Protect from sunlight. Store in a well-ventilated place.

2.3. Other hazards

No additional information available

SECTION 3: Composition/information on ingredients

3.1. Substances

Name : Solstice® ze (R-1234ze)
CAS-No. : 29118-24-9
EC-No. : 471-480-0

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Trans-1,3,3,3-Tetrafluoroprop-1-ene	(CAS-No.) 29118-24-9 (EC-No.) 471-480-0 (REACH-no) 01-0000019758-54	100	Press. Gas (Liq.), H280

Full text of H-statements: see section 16

3.2. Mixtures

Not applicable

Solstice® ze (R-1234ze)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general	: Evacuate danger area. Keep warm and in a quiet place. Get medical advice/attention if you feel unwell. If possible show him this sheet. Failing this, show him the packaging or label. Take off immediately all contaminated clothing.
First-aid measures after inhalation	: Move the affected person away from the contaminated area and into the fresh air. If you feel unwell, seek medical advice.
First-aid measures after skin contact	: In the event of contact with the liquid: treat resulting frostbite as a burn. Immediately remove contaminated clothing or footwear. Immediately rinse with plenty of water. If skin burns appear, call a doctor immediately.
First-aid measures after eye contact	: Rinse immediately and thoroughly, pulling the eyelids well away from the eye (15 minutes minimum). Consult an eye specialist immediately.
First-aid measures after ingestion	: Not specifically applicable (gas).

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

Symptoms/effects	: CNS depression. Narcosis. Cardiac disorders. Lack of oxygen: risk of death.
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4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	: Dry powder. Water fog. Foam. Carbon dioxide.
Unsuitable extinguishing media	: Strong water jet.

5.2. Special hazards arising from the substance or mixture

Fire hazard	: Difficult to ignite. Heating will cause a rise in pressure with a risk of bursting. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Vapours may cause fire/explosion if source of ignition is present.
Hazardous decomposition products in case of fire	: Toxic and corrosive fumes are released. See Heading 10.

5.3. Advice for firefighters

Firefighting instructions	: Use water spray or fog for cooling exposed containers.
Protection during firefighting	: Self-contained breathing apparatus. Complete protective clothing.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	: Avoid contact with skin and eyes. Remove all sources of ignition. Do not smoke. Evacuate the danger area. Do not breathe smoke. Stop the leak. Local evacuation is necessary (for people in close proximity to the spillage area).
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6.1.1. For non-emergency personnel

No additional information available

6.1.2. For emergency responders

No additional information available

6.2. Environmental precautions

Do not allow product to spread into the environment. Do not allow large quantities, as are, to spread into the environment. Do not discharge into drains or rivers.

6.3. Methods and material for containment and cleaning up

Methods for cleaning up	: NEVER aim a water jet directly at a liquid.
Other information	: Mechanically ventilate the spillage area.

Solstice® ze (R-1234ze)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For disposal of solid materials or residues refer to section 13 : "Disposal considerations".

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Avoid breathing spray, mist, fume, gas, dust, vapours. Ensure good ventilation of the work station. Pressurised container. Protect from sunlight and do not expose to temperatures exceeding 50°C. Do not pierce or burn, even after use. Do not spray on an open flame or other ignition source. Heating will cause a rise in pressure with a risk of bursting. Vapours may form explosive mixture with air. Difficult to ignite.

Hygiene measures : Do not drink, eat or smoke in the workplace.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store : only in the original container, the container tightly closed, in a cool, well-ventilated area, away from direct sunlight.

Incompatible materials : Oxidizing materials.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Trans-1,3,3,3-Tetrafluoroprop-1-ene (29118-24-9)

EU - Occupational Exposure Limits

IOELV TWA (ppm)	800 ppm (recommended)
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Trans-1,3,3,3-Tetrafluoroprop-1-ene (29118-24-9)

DNEL/DMEL (Workers)

Long-term - systemic effects, inhalation	3902 mg/m ³
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DNEL/DMEL (General population)

Long-term - systemic effects, inhalation	830 mg/m ³
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PNEC (Water)

PNEC aqua (freshwater)	0.1 mg/l
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8.2. Exposure controls

Materials for protective clothing:

Standard. EN 340, 463, 468, 943-1, 943-2. safety foot-wear. EN ISO 20345

Hand protection:

Leather protective gloves. Nitrile-rubber protective gloves. VITON gloves. EN 374

Eye protection:

Safety glasses with side shields. EN 166

Solstice® ze (R-1234ze)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Skin and body protection:

Majority cotton protective clothing

Respiratory protection:

In the event of insufficient ventilation: Cartridge mask of AX type. In a confined area : Self-contained breathing apparatus. Regulatory Standard. EN 136. EN 140. EN 149

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	: Gas
Appearance	: Press. Gas (Liq.).
Colour	: Colourless.
Odour	: slightly ethereal.
Odour threshold	: No data available
pH	: Not applicable
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: -19 °C
Flash point	: None
Auto-ignition temperature	: 368 °C
Decomposition temperature	: No data available
Flammability (solid, gas)	: Non flammable, Under certain temperature and pressure conditions may form a flammable mixture in the presence of air
Vapour pressure	: 4.27 bar (20°C)
Vapour pressure at 50 °C	: 11.15 bar (54.4°C)
Relative vapour density at 20 °C	: 4
Relative density	: No data available
Density	: 1.17 g/cm ³ (21.1°C)
Solubility	: Water: 0.373 g/l
Partition coefficient n-octanol/water (Log Pow)	: 1.6
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: Not explosive material according to EC criteria.
Oxidising properties	: Non oxidizing material according to EC criteria.
Lower explosive limit (LEL)	: None under normal conditions (20°C)
Upper explosive limit (UEL)	: None under normal conditions (20°C)

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable at ambient temperature and under normal conditions of use.

10.3. Possibility of hazardous reactions

No dangerous polymerization.

10.4. Conditions to avoid

Heat. Pressurised container. Protect from sunlight and do not expose to temperatures exceeding 50°C.

Solstice® ze (R-1234ze)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

10.5. Incompatible materials

Strong oxidizing agents. alkali metals.

10.6. Hazardous decomposition products

To avoid thermal decomposition, do not overheat. Hazardous decomposition products in case of fire. On thermal decomposition (pyrolysis), releases : Carbon oxides (CO, CO₂), Fluorinated hydrocarbons, Hydrogen fluoride.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified
Acute toxicity (dermal) : Not classified
Acute toxicity (inhalation) : Not classified

Trans-1,3,3,3-Tetrafluoroprop-1-ene (29118-24-9)

LC50 Inhalation - Rat [ppm]	> 207000 ppm/1h
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Skin corrosion/irritation : Not irritating to skin
pH: Not applicable
Additional information : Contact with the liquid the may cause cold burns/frostbite
Serious eye damage/irritation : Not classified
pH: Not applicable
Additional information : Contact with the liquefied gas may cause severe ocular lesions
Respiratory or skin sensitisation : Not classified
Germ cell mutagenicity : Not classified
Carcinogenicity : Not classified
Reproductive toxicity : Not classified
STOT-single exposure : Not classified
STOT-repeated exposure : Not classified

Trans-1,3,3,3-Tetrafluoroprop-1-ene (29118-24-9)

NOAEC (inhalation, rat, gas, 90 days)	5000 ppmv/6h/day
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Aspiration hazard : Not classified

SECTION 12: Ecological information

12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute) : Not classified
Hazardous to the aquatic environment, long-term (chronic) : Not classified

Trans-1,3,3,3-Tetrafluoroprop-1-ene (29118-24-9)

LC50 fish 1	> 117 mg/l (96 Hours)
EC50 Daphnia 1	> 160 mg/l 48 Hours (Daphnia magna)
NOEC chronic algae	> 170 mg/l (72h)

Solstice® ze (R-1234ze)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

12.2. Persistence and degradability

Solstice® ze (R-1234ze) (29118-24-9)

Persistence and degradability	Not readily biodegradable.
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Trans-1,3,3,3-Tetrafluoroprop-1-ene (29118-24-9)

Persistence and degradability	Not readily biodegradable.
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12.3. Bioaccumulative potential

Solstice® ze (R-1234ze) (29118-24-9)

Partition coefficient n-octanol/water (Log Pow)	1.6
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Bioaccumulative potential	Bioaccumulation unlikely.
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Trans-1,3,3,3-Tetrafluoroprop-1-ene (29118-24-9)

Partition coefficient n-octanol/water (Log Pow)	1.6
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12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects : Ozone depletion factor ODP (R-11=1) = 0. Total global warming potential (GWP) : 7.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste)	: Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste. Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives (J. o L. 312 of 22.11.2008). Report on cross-border transport of waste mentioned on the green list (Annexe VII regulation CE 1013/2006). Switzerland : OTD : RS 814.600 / OMoD : RS 814.610.
Product/Packaging disposal recommendations	: Methods of disposal of packaging. Reuse or recycle following decontamination. Destroy at an authorised site.
Additional information	: The user's attention is drawn to the possible existence of specific european, national or local regulations regarding disposal.
Ecology - waste materials	: Must not be discharged to atmosphere. Refer to manufacturer or supplier for information on recovery or recycling.

SECTION 14: Transport information




In accordance with ADR / IATA / IMDG

ADR	IMDG	IATA
14.1. UN number		
UN 3163	UN 3163	UN 3163
14.2. UN proper shipping name		
LIQUEFIED GAS, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene)	LIQUEFIED GAS, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene)	Liquefied gas, n.o.s. (Trans-1,3,3,3-Tetrafluoroprop-1-ene)

Solstice® ze (R-1234ze)

Safety Data Sheet

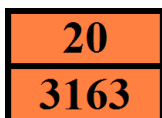
according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

Transport document description		
UN 3163 LIQUEFIED GAS, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene), 2.2, (C/E)	UN 3163 LIQUEFIED GAS, N.O.S. (Trans-1,3,3,3-Tetrafluoroprop-1-ene), 2.2	UN 3163 Liquefied gas, n.o.s. (Trans-1,3,3,3-Tetrafluoroprop-1-ene), 2.2
14.3. Transport hazard class(es)		
2.2	2.2	2.2
		
14.4. Packing group		
Not applicable	Not applicable	Not applicable
14.5. Environmental hazards		
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No
No supplementary information available		

14.6. Special precautions for user

Overland transport

Classification code (ADR)	: 2A
Special provisions (ADR)	: 274, 662
Limited quantities (ADR)	: 120ml
Tank code (ADR)	: PxBN(M)
Transport category (ADR)	: 3
Hazard identification number (Kemler No.)	: 20
Orange plates	:



Tunnel restriction code (ADR)	: C/E
EAC code	: 2TE

Transport by sea

Special provisions (IMDG)	: 274
Limited quantities (IMDG)	: 120 ml
EmS-No. (Fire)	: F-C
EmS-No. (Spillage)	: S-V

Air transport

PCA Limited quantities (IATA)	: Forbidden
PCA limited quantity max net quantity (IATA)	: Forbidden
PCA packing instructions (IATA)	: 200
PCA max net quantity (IATA)	: 75kg
CAO packing instructions (IATA)	: 200
CAO max net quantity (IATA)	: 150kg

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

Solstice® ze (R-1234ze)

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830

SECTION 15: Regulatory information

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

15.1.1. EU-Regulations

No REACH Annex XVII restrictions

Solstice® ze (R-1234ze) is not on the REACH Candidate List

Solstice® ze (R-1234ze) is not on the REACH Annex XIV List

Solstice® ze (R-1234ze) is not subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

Solstice® ze (R-1234ze) is not subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

15.1.2. National regulations

Ensure all national/local regulations are observed.

Germany

Water hazard class (WGK) : WGK 1, Slightly hazardous to water (Classification according to AwSV; ID No. 9699)

Hazardous Incident Ordinance (12. BImSchV) : Is not subject of the Hazardous Incident Ordinance (12. BImSchV)

Netherlands

SZW-lijst van kankerverwekkende stoffen : The substance is not listed

SZW-lijst van mutagene stoffen : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting : The substance is not listed

giftige stoffen – Borstvoeding

NIET-limitatieve lijst van voor de voortplanting : The substance is not listed

giftige stoffen – Vruchtbaarheid

NIET-limitatieve lijst van voor de voortplanting : The substance is not listed

giftige stoffen – Ontwikkeling

Switzerland

Swiss National Regulations : ORRChim RS 814.81.

15.2. Chemical safety assessment

No additional information available

SECTION 16: Other information

Other information : For more information regarding the use of this product, please refer to our technical information or contact the sales department in your region.

Full text of H- and EUH-statements:

Press. Gas (Liq.)	Gases under pressure : Liquefied gas
H280	Contains gas under pressure; may explode if heated.

SDS EU (REACH Annex II)

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.