Solstice® 1234ze

000000012546

Version 8.18 Revision Date 20.12.2024 Supersedes 7

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

1.1. Product identifier

Product name	:	Solstice® 1234ze
SDS-number	:	000000012546
Type of product	:	Substance
Remarks	:	SDS according to Art. 31 of Regulation (EC) 1907/2006.
Chemical name	:	trans-1,3,3,3-Tetrafluoroprop-1-ene
CAS-No.	:	29118-24-9
REACH Registration Number	:	UK-01-4824215216

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

Use of the Substance/Mixture	:	Foam blowing agent
Uses advised against	:	none

1.3. Details of the supplier of the safety data sheet

Company	:	Honeywell Advanced Limited One Spencer Dock, North Wall Quay Dublin 1 Ireland	Honeywell International, Inc. 115 Tabor Road Morris Plains, NJ 07950-2546 USA
Telephone	:	+353 1 447 9350	
For further information, please contact:	:	SafetyDataSheet@Honeywell.com	

1.4. Emergency telephone number

Emergency telephone number	:	+1-703-527-3887 (ChemTrec-Transport) +1-303-389-1414 (Medical)
	:	Poison Control Center: United Kingdom: (+44) 844 892 0111

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

REGULATION (EC) No 1272/2008

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	:	P410 + P403	Protect from sunlight. Store in a well-ventilated place.
Special labelling of certain products:	:	Contains fluorinated greenhouse gases.	

2.3. Other hazards

Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Rapid evaporation of the liquid may cause frostbite. This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher. The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.1. Substances

Chemical name	CAS-No. Index-No. REACH Registration Number EC-No.	Classification 1272/2008	Concentration	Remarks
trans-1,3,3,3-Tetrafluoroprop-1-ene	29118-24-9 UK-01-4824215216 471-480-0	Press. Gas ; H280	100 %	

3.2. Mixtures

Not applicable

Occupational Exposure Limit(s), if available, are listed in Section 8.
For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice:
First aider needs to protect himself. Move out of dangerous area. Keep warm and in a quiet place. Show this safety data sheet to the doctor in attendance. Take off all contaminated clothing immediately.

Inhalation:
If inhaled, remove to fresh air. Get medical attention if irritation develops and persists.

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:
Immediately flush eye(s) with plenty of water. Call a physician immediately.

Ingestion:
Ingestion is unlikely because of the physical properties and is not expected to be hazardous. As 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: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media:
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Water mist
Dry powder
Foam
Carbon dioxide (CO_2)

5.2. Special hazards arising from the substance or mixture

Contents under pressure.
Heating will cause pressure rise with risk of bursting
Cool closed containers exposed to fire with water spray.
Product is not combustible under normal conditions.
However, this material can ignite when mixed with air under pressure and exposed to strong ignition sources.
Do not allow run-off from fire fighting to enter drains or water courses.
Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
Some risk may be expected of corrosive and toxic decomposition products.
Fire may cause evolution of:
Hydrogen fluoride
Carbon oxides
Carbonyl halides
Halogenated compounds

5.3. Advice for firefighters

Wear full protective clothing and self-contained breathing apparatus.
Exposure to decomposition products may be a hazard to health.
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.In the event of fire, cool tanks with water spray.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Provide adequate ventilation. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing. Avoid skin contact with leaking liquid (danger of frostbite). Use personal protective equipment. Keep people away from and upwind of spill/leak.

6.2. Environmental precautions

Prevent further leakage or spillage if safe to do so. The product evaporates readily. Prevent spreading over a wide area (e.g. by containment or oil barriers).

6.3. Methods and materials for containment and cleaning up

Do not direct water spray at the point of leakage.
Allow to evaporate.

6.4. Reference to other sections

For personal protection see section 8.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling:
Pressurized container: protect from sunlight and do not expose to temperatures exceeding 50 °C. Do not pierce or burn, even after use. Exhaust ventilation at the object 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 packages. Vapours may form explosive mixtures with air. The product is not easily combustible.

Hygiene measures:

Avoid breathing vapours, mist or gas. Keep working clothes separately.

7.2. Conditions for safe storage, including any incompatibilities

Further information on storage conditions:
Keep containers tightly closed in a cool, well-ventilated place. Keep only in the original container at temperature not exceeding 50°C Keep away from direct sunlight.

Advice on common storage:
Do not store together with: Oxidizing agents

7.3. Specific end use(s)

no additional data available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits:

Components	Basis / Value type	Value / Form of exposure	Exceeding Factor	Remarks
trans-1,3,3,3-Tetrafluoroprop-1-ene	HONEYWELL TWA	800 ppm		We are not aware of any national exposure limit.

HONEYWELL - Limit established by Honeywell International Inc.
TWA - Time weighted average

DNEL/ PNEC-Values

Component	End-use/impact	Exposure duration	Value	Exposure routes	Remarks
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		830 mg/m3	Inhalation	

	effects				

Component	Environmental compartment / Value	Remarks
trans-1,3,3,3-Tetrafluoroprop-1-ene	Fresh water: 0,1 mg/l	Assessment factor: 1000

8.2. Exposure controls

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, 511; 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.

Engineering measures
Local exhaust

Personal protective equipment
Respiratory protection:
In case of insufficient ventilation wear suitable respiratory equipment.
Self-contained breathing apparatus (EN 133)

Hand protection:
Protective gloves against cold
(EN 511)
Gloves must be inspected prior to use.
Replace when worn.

Eye protection:
Goggles

Skin and body protection:
Wear suitable protective equipment.
Protective footwear

Environmental exposure controls

Handle in accordance with local environmental regulations and good industrial practices.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

(a) Physical state	:	gaseous
(b) Colour	:	colourless
(c) Odour	:	slight ether-like
(e) Boiling point/boiling range	:	-19 °C
(f) Flammability	:	does not ignite Method: Flammability (gases)
(g) Lower and upper explosion limit	:	Lower explosion limit No LEL and UEL was assigned at standard testing conditions, 20°C. Exhibits flame limits at temperatures in excess of 28˚ C.
	:	Upper explosion limit No LEL and UEL was assigned at standard testing conditions, 20°C. Exhibits flame limits at temperatures in excess of 28˚ C.
(h) Flash point	:	Not applicable
(i) Auto-ignition temperature	:	368 °C
(j) Decomposition temperature	:	Hazardous decomposition products formed under fire conditions. To avoid thermal decomposition, do not overheat.
(k) pH	:	neutral
(l) Viscosity, kinematic	:	No data available

(m) Solubility(ies)	:	Water solubility: 0,373 g/l
(n) Partition coefficient: n-octanol/water	:	log Pow 1,6
(o) Vapour pressure	:	4.271 hPa at 20 °C 11.152 hPa at 54,4 °C
(p) Density and / or relative density	:	1,17 g/cm3 at 21,1 °C
(q) Relative vapour density	:	4 (Air = 1.0)
(r) Particle characteristics	:	No data available

9.2 Other Information

Oxidizing properties	:	The substance or mixture is not classified as oxidizing.

SECTION 10: Stability and reactivity

10.1. Reactivity

Stable under normal conditions.

10.2. Chemical stability

Hazardous decomposition products formed under fire conditions.
To avoid thermal decomposition, do not overheat.

10.3. Possibility of hazardous reactions

Hazardous polymerisation does not occur.

10.4. Conditions to avoid

Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50 °C.
Can form a combustible mixture with air at pressures above atmospheric pressure.

10.5. Incompatible materials

Reactions with alkali metals.

10.6. Hazardous decomposition products

Halogenated compounds
Carbon oxides
Hydrogen fluoride
Carbonyl halides

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

(a) 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

(b) Skin corrosion/irritation:
Species: Rabbit
Result: No skin irritation
Method: OECD Test Guideline 404

(c) Serious eye damage/eye irritation:
No data available
study technically not feasible

(d) Respiratory or skin sensitisation:
Species: human
Result: Does not cause skin sensitisation.

(e) 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

(f) Carcinogenicity:
Note: No data available

(g) 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

(h) STOT-single exposure:
No data available

(i) STOT - repeated exposure:
Species: Rat
Application Route: Inhalation
Exposure time: 90 d
NOEL: 5000
Method: OECD Test Guideline 413
Note: Subchronic toxicity

(j) Aspiration hazard:
No data available

11.2. Information on other hazards

Endocrine disrupting properties
No data available

Other information:
Cardiac Sensitization (dog): No effects

SECTION 12: Ecological information

12.1. Toxicity

Toxicity to fish:
LC0
static test
Species: Cyprinus carpio (Carp)
Value: > 117 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to aquatic plants:
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

Toxicity to aquatic invertebrates:
EC50
static test
Species: Daphnia magna (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

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. Endocrine disrupting properties

No data available

12.7. Other adverse effects

No data available

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 materials

Further information:
Provisions relating to waste:
EC Directive 2006/12/EC; 2008/98/EEC
Regulation No. 1013/2006
For personal protection see section 8.

SECTION 14: Transport information

14.1 UN number or ID number

ADR/RID:3163 IMDG:3163 IATA:3163

14.2 UN proper shipping name

ADR/RID:LIQUEFIED GAS, N.O.S.(TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)
IMDG:LIQUEFIED GAS, N.O.S.(TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE)
IATA:Liquefied gas, n.o.s.(trans-1,3,3,3-Tetrafluoroprop-1-ene)

14.3 Transport hazard class(es)

ADR/RID:2.2 IMDG: 2.2 IATA: 2.2

14.4 Packaging group

No data available

14.5 Environmental hazards

ADR/RID:no Marine pollutant: no

14.6 Special precautions for user

IMDG Code segregation group according chapter 3.1.4.4 : NONE,

14.7 Maritime transport in bulk according to IMO instruments

No data available

SECTION 15: Regulatory information

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

Basis	Value	Remarks
Directive 2012/18/EC SEVESO III		Not listed
Substances of very high concern (SVHC)		This product does not contain substances of very high concern according to Regulation (EC) No Article 57 above the respective regulatory 1907/2006 (REACH), concentration limit of ≥ 0.1 % (w/w).
Regulation (EC) No. 1907/2006, Annex XIV		Not listed
Regulation (EC) No. 1907/2006, Annex XVII		Not listed
Regulation (EU) No 517/2014 Annex II		Listed

Global warming potential :
7

Other inventory information

USA. List of Active Substances on the Toxic Substances Control Act (TSCA) Chemical Substances Inventory, as amended
On TSCA Inventory

Australia. Inventory of Industrial Chemicals (AIIC), as amended
On the inventory, or in compliance with the inventory

Canada. Domestic Substances List (DSL), as amended
All components of this product are on the Canadian DSL

Japan. Kashin-Hou Law List

On the inventory, or in compliance with the inventory

Korea. Existing Chemicals Inventory (KECI)
On the inventory, or in compliance with the inventory

Philippines. Inventory of Chemicals and Chemical Substances (PICCS)
Not in compliance with the inventory

China. Inventory of Existing Chemical Substances (IECSC)
On the inventory, or in compliance with the inventory

New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand
On the inventory, or in compliance with the inventory

Taiwan Chemical Substance Inventory (TCSI)
On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

A chemical safety assessment has been carried out. In accordance to the article 14(4) of the REACH regulation (EC) No. 1907/2006, exposure estimation and risk characterization is not required.

SECTION 16: Other information

Text of H-statements referred to under heading 3

trans-1,3,3,3-Tetrafluoroprop-1-ene	:	H280	Contains gas under pressure; may explode if heated.

Further information

All directives and regulations refer to amended versions.
Vertical lines in the left hand margin indicate a relevant amendment from the previous version.

Abbreviations:
EC European Community
CAS Chemical Abstracts Service
DNEL Derived no effect level
PNEC Predicted no effect level
vPvB Very persistent and very biaccumulative substance

PBT Persistent, bioaccmulative und toxic substance

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