

Solstice® N15 (R-515B)

000000021925

Version 1.7

Revision Date 06.11.2025

SECTION 1: Identification of the substance/mixture and of the company/undertaking**1.1. Product identifier**

Product name : Solstice® N15 (R-515B)
SDS-number : 000000021925
Type of product : Mixture
Remarks : SDS according to Art. 31 of Regulation (EC) 1907/2006.

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

Use of the Substance/Mixture : Refrigerant

Uses advised against : none

1.3. Details of the supplier of the safety data sheet

Company : SOLSTICE ADVANCED MATERIALS IRELAND LIMITED
1st Floor, Liffey Trust Centre,
117-126 Sheriff Street Upper
D01 YC43 Dublin
Ireland
Solstice Advanced Materials
US, Inc.
115 Tabor Road
Morris Plains, NJ 07950-2546
USA

Telephone : +353 1 447 9350
For further information,
please contact: : SafetyDataSheet@solstice.com

1.4. Emergency telephone number

Emergency telephone number : +1-703-527-3887 (ChemTrec-Transport)
+1 303-739-1378 (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**

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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

Not applicable

3.2. Mixtures

Chemical name	CAS-No. Index-No. EC-No.	Classification 1272/2008	Concentration	Remarks

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trans-1,3,3,3-Tetrafluoroprop-1-ene	29118-24-9 471-480-0	Press. Gas ; H280	91,1 %	
1,1,1,2,3,3,3-Heptafluoropropane	431-89-0 207-079-2	Press. Gas ; H280	8,9 %	

Remaining components of this product are non-hazardous and/or are present at concentrations below reportable limits.

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:

Show this safety data sheet to the doctor in attendance. Keep warm and in a quiet place.

Inhalation:

Remove to fresh air. If breathing is irregular or stopped, administer artificial respiration. Use oxygen as required, provided a qualified operator is present. Call a physician.

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:

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. If symptoms persist, call a physician.

Ingestion:

Unlikely route of exposure. As this product is a gas, refer to the inhalation section. Do not induce vomiting without medical advice. Call a physician immediately.

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

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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 (CO₂)

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.

This product is not flammable at ambient temperatures and atmospheric pressure.

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

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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**

Immediately evacuate personnel to safe areas. Keep people away from and upwind of spill/leak. Wear personal protective equipment. Unprotected persons must be kept away. Remove all sources of ignition. Avoid skin contact with leaking liquid (danger of frostbite). Ventilate the area. After release, disperses into the air. Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.

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:

The product is not flammable. 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.

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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.

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 Solstice Advanced Materials
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/m ³	Inhalation	
trans-1,3,3,3-Tetrafluoroprop-1-ene	Consumers / Long-term systemic effects		830 mg/m ³	Inhalation	
1,1,1,2,3,3,3-	Workers /		61279	Inhalation	

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Heptafluoropropane	Long-term systemic effects		mg/m ³		
1,1,1,2,3,3,3-Heptafluoropropane	Consumers / Long-term systemic effects		6533 mg/m ³	Inhalation	

Component	Environmental compartment / Value	Remarks
trans-1,3,3,3-Tetrafluoroprop-1-ene	Fresh water: 0,1 mg/l	Assessment factor: 1000
1,1,1,2,3,3,3-Heptafluoropropane	Fresh water: 0,1 mg/l	Assessment factor: 1000
1,1,1,2,3,3,3-Heptafluoropropane	Sewage treatment plant: 1,73 mg/l	Assessment factor: 100
1,1,1,2,3,3,3-Heptafluoropropane	Fresh water sediment: 1,3 mg/kg dw	

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)

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Gloves must be inspected prior to use.
Replace when worn.

Eye protection:
Goggles

Skin and body protection:
Wear suitable protective equipment.
Wear as appropriate:
Protective suit

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 |
| (d) Melting point/freezing point | : | No data available |
| (f) Flammability | : | The product is not flammable. |
| (g) Lower and upper explosion limit | : | Lower explosion limit
No data available |
| | : | Upper explosion limit
No data available |
| (h) Flash point | : | Not applicable |
| (i) Auto-ignition temperature | : | not determined |
| (j) Decomposition temperature | : | Hazardous decomposition products formed under fire conditions. |

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To avoid thermal decomposition, do not overheat.

- (k) pH : neutral
- (l) Viscosity, kinematic : Not applicable
- (m) Solubility(ies) : Water solubility:
No data available
- (n) Partition coefficient: n-
octanol/water : No data available
- (o) Vapour pressure : 440 kPa
at 21 °C
- (p) Density and / or relative
density : No data available
- (q) Relative vapour density : No data available
- (r) Particle characteristics : No data available

9.2 Other Information

Polymer characteristics : No data available

no additional data available

SECTION 10: Stability and reactivity**10.1. Reactivity**

Stable under normal conditions.

10.2. Chemical stabilityHazardous decomposition products formed under fire conditions.
To avoid thermal decomposition, do not overheat.**10.3. Possibility of hazardous reactions**

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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

Carbon oxides
Carbonyl halides
Hydrogen fluoride
Halogenated compounds

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
Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

LC50

Species: Rat
Value: > 241000 ppm
Exposure time: 4 h

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Test substance: Propane, 1,1,1,2,3,3,3-heptafluoro- (HFC-227ea)

Acute toxicity (other routes of administration):

No data available

(b) Skin corrosion/irritation:

Species: Rabbit

Result: No skin irritation

Method: OECD Test Guideline 404

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

(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.

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

(e) Germ cell mutagenicity:

Test Method: Chromosome aberration test in vitro

Cell type: Human lymphocytes

Result: negative

Method: OECD Test Guideline 473

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

Test Method: Ames test

Result: negative

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

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

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

Result: negative

(f) Carcinogenicity:

Note: No data available

(g) Reproductive toxicity:

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Species: Rabbit

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

Method: OECD 416

Note: Did not show teratogenic effects in animal experiments.

Species: Rat

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

Method: OECD 416

Note: Did not show teratogenic effects in animal experiments.

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

Remarks: trans-1,3,3,3-Tetrafluoroprop-1-ene

Method: OECD Test Guideline 414

Species: Rat

Route of Application: Inhalation

General Toxicity Maternal: NOEC: 15.000 ppm

Developmental Toxicity: NOAEC: 15.000 ppm

Remarks: trans-1,3,3,3-Tetrafluoroprop-1-ene

(h) STOT-single exposure:

No data available

(i) STOT - repeated exposure:

Species: Rat

Application Route: Inhalation

Exposure time: 90 d

NOEL: 5000

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

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

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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

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

Toxicity to aquatic plants:

NOEC

Growth rate

Species: Algae

Value: > 170 mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

NOEC

Biomass

Species: Algae

Value: > 170 mg/l

Exposure time: 72 h

Method: OECD Test Guideline 201

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

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

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

12.2. Persistence and degradability

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Biodegradability:

aerobic

Result: Not readily biodegradable.

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

12.3. Bioaccumulative potential

Test substance: trans-1,3,3,3-Tetrafluoroprop-1-ene

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

No data available

12.6. Endocrine disrupting properties

No data available

12.7. Other adverse effectsNo data available

SECTION 13: Disposal considerations**13.1. Waste treatment methods***Product:*

Dispose according to legal requirements.

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

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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, 1,1,1,2,3,3,3-HEPTAFLUOROPROPANE)

IMDG:LIQUEFIED GAS, N.O.S.(TRANS-1,3,3,3-TETRAFLUOROPROP-1-ENE,1,1,1,2,3,3,3-HEPTAFLUOROPROPANE)

IATA:Liquefied gas, n.o.s.(trans-1,3,3,3-Tetrafluoroprop-1-ene, 1,1,1,2,3,3,3-Heptafluoropropane)

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
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).
Directive 2012/18/EC		Not applicable

Global warming potential :

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Other inventory information

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

All substances listed as active on the TSCA inventory

Australian Inventory of Industrial Chemicals

All components are listed on the inventory, regulatory obligations/restrictions apply

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

Taiwan Chemical Substance Inventory (TCSI)

On the inventory, or in compliance with the inventory

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information**Text of H-statements referred to under heading 3**

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

1,1,1,2,3,3,3- : H280 Contains gas under pressure; may explode if heated.

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Heptafluoropropane

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 bioaccumulative substance

PBT Persistent, bioaccumulative und toxic substance

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user.

This information should not constitute a guarantee for any specific product properties.

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