

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

#### 1.1. Product identifier

Product form	: Substance
Trade name	: Solstice® yf (R-1234yf)
Name	: 2,3,3,3-Tetrafluoroprop-1-ene
EC-No.	: 468-710-7
CAS-No.	: 754-12-1
REACH registration No	: 01-0000019665-61
Product code	: 100123500

#### 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](mailto:ContactFDS@climalife.dehon.com)

##### Other

Climalife Kft Budepesta sucursală Bucuresti Romania  
 Bulevardul Hristo Botev, Nr. 28, Biroul NR 4, Modulul I  
 Bucuresti Sectorul 3  
 Romania  
[ContactFDS@climalife.dehon.com](mailto: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](mailto: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](mailto: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](mailto:ContactFDS@climalife.dehon.com)

##### Other

Prochimac SA  
 ZI Petits Champs 15

##### Other

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

##### Other

Dehon nordic service  
 Östra Hamngatan 50B 3tr  
 41109 GÖTEBORG  
 Sweden  
 T 00 46 735 01 90 50  
[ContactFDS@climalife.dehon.com](mailto: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](mailto: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](mailto:ContactFDS@climalife.dehon.com)

# Solstice® yf (R-1234yf)

## Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

CH-1400 Yverdon-les-Bains  
Switzerland  
T 00 41 32 727 36 00 - F 00 41 32 727 36 19  
[ContactFDS@climalife.dehon.com](mailto:ContactFDS@climalife.dehon.com)

### 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	0344 892 0111	Only for healthcare professionals

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

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

Flam. Gas 1B H221

Press. Gas (Liq.) H280

Full text of hazard classes, H- and EUH-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.

### 2.2. Label elements

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

Hazard pictograms (CLP) :



GHS02

Signal word (CLP) :

Danger

Hazard statements (CLP) :

H221 - Flammable gas.

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

Precautionary statements (CLP) :

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P377 - Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

P381 - In case of leakage, eliminate all ignition sources.

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

### 2.3. Other hazards

Contains no PBT/vPvB substances  $\geq 0.1\%$  assessed in accordance with REACH Annex XIII

#### Component

2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII  
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Name : 2,3,3,3-Tetrafluoroprop-1-ene

CAS-No. : 754-12-1

EC-No. : 468-710-7

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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
2,3,3,3-Tetrafluoroprop-1-ene	CAS-No.: 754-12-1 EC-No.: 468-710-7 REACH-no: 01-0000019665-61	100	Flam. Gas 1B, H221 Press. Gas (Liq.), H280

Full text of H- and EUH-statements: see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

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. Rinse with plenty of water. Do not remove clothing (since it may stick to the skin). 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.

### 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	: Water spray, dry chemical powder, alcohol-resistant foam, carbon dioxide (CO <sub>2</sub> ).
Unsuitable extinguishing media	: Strong water jet.

### 5.2. Special hazards arising from the substance or mixture

Fire hazard	: Flammable gas. 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.
Hazardous decomposition products in case of fire	: Thermal decomposition generates : Carbon oxides (CO, CO <sub>2</sub> ), Hydrogen halogenides, Carbonyl halogenides, fluorinated compounds.

### 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	: Do not attempt to take action without suitable protective equipment. Avoid contact with skin and eyes. Do not breathe smoke. Do not smoke. Evacuate personnel to a safe area. Ventilate spillage area. Stop leak without risks if possible.
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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

Product evaporates rapidly when in contact with the air. Prevent entry to sewers and public waters.

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

Other information : Mechanically ventilate the spillage area.

## 6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection".

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Precautions for safe handling : Pressurised container. Protect from sunlight and do not expose to temperatures exceeding 50°C. Ensure good ventilation of the work station. Do not pierce or burn, even after use. Use non-sparking tools. Do not use joint paste that may contain peroxides.

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

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

Storage conditions : Keep container tight closed. Store : in a cool, well-ventilated area. Store in original container.

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1 National occupational exposure and biological limit values

2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)	
EU - Indicative Occupational Exposure Limit (IOEL)	
IOEL TWA [ppm]	500 ppm (recommended)

#### 8.1.2. Recommended monitoring procedures

No additional information available

#### 8.1.3. Air contaminants formed

No additional information available

#### 8.1.4. DNEL and PNEC

2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)	
DNEL/DMEL (Workers)	
Long-term - systemic effects, inhalation	23000 mg/m³
PNEC (Water)	
PNEC aqua (freshwater)	> 0.1 mg/l
PNEC aqua (marine water)	> 0.01 mg/l

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### 2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)

#### PNEC (Sediment)

PNEC sediment (marine water)	> 0.178 mg/kg dwt
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#### PNEC (Soil)

PNEC soil	> 1.54 mg/kg dwt
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#### 8.1.5. Control banding

No additional information available

### 8.2. Exposure controls

#### 8.2.1. Appropriate engineering controls

No additional information available

#### 8.2.2. Personal protection equipment

##### 8.2.2.1. Eye and face protection

###### Eye protection:

Safety glasses with side shields

##### 8.2.2.2. Skin protection

###### Skin and body protection:

Majority cotton protective clothing

###### Hand protection:

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

##### 8.2.2.3. Respiratory protection

###### Respiratory protection:

In the event of insufficient ventilation: Gas mask with filter type AX. In a confined area : Self-contained breathing apparatus

##### 8.2.2.4. Thermal hazards

No additional information available

#### 8.2.3. Environmental exposure controls

No additional information available

## SECTION 9: Physical and chemical properties

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

Physical state	: Gas
Colour	: Colourless.
Appearance	: Press. Gas (Liq.).
Molecular mass	: 114 g/mol
Odour	: slightly ethereal.
Odour threshold	: Not available
Melting point	: Not applicable
Freezing point	: Not applicable
Boiling point	: -29.49 °C
Flammability	: Flammable gas.
Explosive properties	: Not explosive material according to EC criteria.
Oxidising properties	: Non oxidizing material according to EC criteria.
Explosive limits	: Not available
Lower explosion limit	: 6.2 vol %
Upper explosion limit	: 12.3 vol %
Flash point	: Not applicable
Auto-ignition temperature	: 405 °C
Decomposition temperature	: Not available
pH	: Not applicable

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Viscosity, kinematic	: Not applicable
Solubility	: Water: 198.2 mg/l (24°C)
Partition coefficient n-octanol/water (Log Kow)	: Not available
Partition coefficient n-octanol/water (Log Pow)	: 2.15
Vapour pressure	: 6.83 bar (25°C)
Vapour pressure at 50°C	: 13.02 bar (50°C)
Critical pressure	: 33.82 bar
Density	: 1092 kg/m <sup>3</sup> (25°C)
Relative density	: 4
Relative vapour density at 20°C	: Not available
Particle characteristics	: Not applicable

### 9.2. Other information

#### 9.2.1. Information with regard to physical hazard classes

Critical temperature : 94.7 °C

#### 9.2.2. Other safety characteristics

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Stable under normal conditions of use.

### 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

Pressurised container. Protect from sunlight and do not expose to temperatures exceeding 50°C. Container under pressure. Do not drill or burn even after use. No flames, no sparks. Eliminate all sources of ignition.

### 10.5. Incompatible materials

Do not use joint paste that may contain peroxides. React in contact of alkali metals, Light metals. zinc. Magnesium. Strong oxidizing agents.

### 10.6. Hazardous decomposition products

Hazardous decomposition products may be released during prolonged heating like smokes, carbon monoxide and dioxide. Hydrogen fluoride. Carbonyl halogenides.

## SECTION 11: Toxicological information

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

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

#### 2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)

LC50 Inhalation - Rat [ppm]	> 400000 ppm/4h
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Skin corrosion/irritation	: Not classified pH: Not applicable
Additional information	: Contact with the liquid causes frostbite
Serious eye damage/irritation	: Not classified pH: Not applicable
Additional information	: Contact with the liquefied gas may cause severe ocular lesions

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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
Aspiration hazard	: Not classified

### 11.2. Information on other hazards

No additional information available

## 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

#### 2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)

LC50 - Fish [1]	> 197 mg/l <i>Cyprinus carpio</i> (Common carp)
EC50 - Crustacea [1]	> 83 mg/l ( <i>Daphnia magna</i> )
EC50 72h - Algae [1]	> 100 mg/l ( <i>scenedesmus capricornutum</i> )

### 12.2. Persistence and degradability

#### 2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)

Persistence and degradability	Not readily biodegradable.
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### 12.3. Bioaccumulative potential

#### Solstice® yf (R-1234yf) (754-12-1)

Partition coefficient n-octanol/water (Log Pow)	2.15
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#### 2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)

Partition coefficient n-octanol/water (Log Pow)	2.15
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### 12.4. Mobility in soil

No additional information available

### 12.5. Results of PBT and vPvB assessment

#### Component

2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
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### 12.6. Endocrine disrupting properties

No additional information available

### 12.7. Other adverse effects

Additional information	: GWP (CO <sub>2</sub> =1/100 years) = 4
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### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

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. Refer to manufacturer or supplier for information on recovery or recycling.
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 / IMDG / IATA

ADR	IMDG	IATA
<b>14.1. UN number or ID number</b>		
UN 3161	UN 3161	UN 3161
<b>14.2. UN proper shipping name</b>		
LIQUEFIED GAS, FLAMMABLE, N.O.S. (2,3,3,3-Tetrafluoroprop-1-ene)	LIQUEFIED GAS, FLAMMABLE, N.O.S. (2,3,3,3-Tetrafluoroprop-1-ene)	Liquefied gas, flammable, n.o.s. (2,3,3,3-Tetrafluoroprop-1-ene)
<b>Transport document description</b>		
UN 3161 LIQUEFIED GAS, FLAMMABLE, N.O.S. (2,3,3,3-Tetrafluoroprop-1-ene), 2.1, (B/D)	UN 3161 LIQUEFIED GAS, FLAMMABLE, N.O.S. (2,3,3,3-Tetrafluoroprop-1-ene), 2.1	UN 3161 Liquefied gas, flammable, n.o.s. (2,3,3,3-Tetrafluoroprop-1-ene), 2.1
<b>14.3. Transport hazard class(es)</b>		
2.1	2.1	2.1
		
<b>14.4. Packing group</b>		
Not applicable	Not applicable	Not applicable
<b>14.5. Environmental hazards</b>		
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)	: 2F
Special provisions (ADR)	: 274, 662
Limited quantities (ADR)	: 0
Tank code (ADR)	: PxBN(M)
Transport category (ADR)	: 2
Hazard identification number (Kemler No.)	: 23



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Orange plates : 

23
3161

Tunnel restriction code (ADR) : B/D  
EAC code : 2YE

### Transport by sea

Special provisions (IMDG) : 274  
Limited quantities (IMDG) : 0  
EmS-No. (Fire) : F-D  
EmS-No. (Spillage) : S-U

### Air transport

PCA Limited quantities (IATA) : Forbidden  
PCA limited quantity max net quantity (IATA) : Forbidden  
PCA packing instructions (IATA) : Forbidden  
PCA max net quantity (IATA) : Forbidden  
CAO packing instructions (IATA) : 200  
CAO max net quantity (IATA) : 150kg  
Special provisions (IATA) : A1

## 14.7. Maritime transport in bulk according to IMO instruments

Not applicable

## SECTION 15: Regulatory information

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

#### 15.1.1. EU-Regulations

##### REACH Annex XVII (Restriction List)

Not listed on REACH Annex XVII

##### REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

##### REACH Candidate List (SVHC)

Not listed on the REACH Candidate List

##### PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

##### POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

##### Ozone Regulation (1005/2009)

Not listed on the Ozone Depletion list (Regulation EU 1005/2009)

##### Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

##### Drug Precursors Regulation (273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

#### 15.1.2. National regulations

Ensure all national/local regulations are observed.

### 15.2. Chemical safety assessment

No additional information available

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### SECTION 16: Other information

#### Indication of changes:

All chapters have been modified since the previous version.

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:

Flam. Gas 1B	Flammable gases, Category 1B
H221	Flammable gas.
H280	Contains gas under pressure; may explode if heated.
Press. Gas (Liq.)	Gases under pressure : Liquefied gas

Safety Data Sheet (SDS), EU

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.