

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

#### 1.1. Product identifier

Product form : Mixture  
 Name : Solstice® L41y (R-452B)  
 Product code : 100145300

#### 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  
 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](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 Birmingham	0344 892 0111	

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

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

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

Flam. Gas 1 H220  
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.

#### 2.2. Label elements

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

Hazard pictograms (CLP) :



GHS02

Signal word (CLP) : Danger  
Hazard statements (CLP) : H220 - Extremely 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.  
Extra phrases : Greenhouse fluorinated gas falling within Kyoto Protocol (GWP=698).

#### 2.3. Other hazards

No additional information available

### SECTION 3: Composition/information on ingredients

#### 3.1. Substances

Not applicable

#### 3.2. Mixtures

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Difluoromethane substance with a Community workplace exposure limit substance with national workplace exposure limit(s) (CZ)	(CAS-No.) 75-10-5 (EC-No.) 200-839-4 (REACH-no) 01-2119471312-47	67	Flam. Gas 1, H220 Press. Gas (Liq.), H280
2,3,3,3-Tetrafluoroprop-1-ene substance with a Community workplace exposure limit substance with national workplace exposure limit(s) (DE)	(CAS-No.) 754-12-1 (EC-No.) 468-710-7 (REACH-no) 01-0000019665-61	26	Flam. Gas 1, H220 Press. Gas (Liq.), H280
Pentafluoroethane substance with a Community workplace exposure limit substance with national workplace exposure limit(s) (CZ, SE)	(CAS-No.) 354-33-6 (EC-No.) 206-557-8 (REACH-no) 01-2119485636-25	7	Press. Gas (Liq.), H280

Full text of H-statements: see section 16

### 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).

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### 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 : Extremely 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 gas/vapours are formed in the event of decomposition (see section 10).

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.

#### 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

#### Solstice® L41y (R-452B)

##### Sweden - Occupational Exposure Limits

Anmärkning (SE)	V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
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##### Difluoromethane (75-10-5)

##### EU - Occupational Exposure Limits

IOELV TWA (mg/m <sup>3</sup> )	2200 (recommended)
IOELV TWA (ppm)	1000 ppm (recommended)

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Czech Republic - Occupational Exposure Limits	
Expoziční limity (PEL) (mg/m <sup>3</sup> )	2000 mg/m <sup>3</sup>
Expoziční limity (PEL) (ppm)	940 ppm
Expoziční limity (NPK-P) (mg/m <sup>3</sup> )	5000 mg/m <sup>3</sup>
Expoziční limity (NPK-P) (ppm)	2350 ppm
2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)	
EU - Occupational Exposure Limits	
IOELV TWA (ppm)	500 ppm (recommended)
Germany - Occupational Exposure Limits (TRGS 900)	
TRGS 900 Occupational exposure limit value (mg/m <sup>3</sup> )	950 mg/m <sup>3</sup>
TRGS 900 Occupational exposure limit value (ppm)	200 ppm
Pentafluoroethane (354-33-6)	
EU - Occupational Exposure Limits	
IOELV TWA (mg/m <sup>3</sup> )	4900 mg/m <sup>3</sup> (recommended)
IOELV TWA (ppm)	1000 ppm (recommended)
Czech Republic - Occupational Exposure Limits	
Local name	Pentafluoromethan
Expoziční limity (PEL) (mg/m <sup>3</sup> )	5000 mg/m <sup>3</sup>
Expoziční limity (PEL) (ppm)	1020 ppm
Regulatory reference	Nařízení vlády č. 361/2007 Sb. (zpracovány změny č. 93/2012 Sb., 9/2013 Sb.)
Sweden - Occupational Exposure Limits	
Local name	1,1,1,2,2-Pentafluoretan
nivågränsvärde (NVG) (mg/m <sup>3</sup> )	2500 mg/m <sup>3</sup>
nivågränsvärde (NVG) (ppm)	500 ppm
kortidsvärde (KTV) (mg/m <sup>3</sup> )	3750 mg/m <sup>3</sup>
kortidsvärde (KTV) (ppm)	750 ppm
Anmärkning (SE)	V (Vägledande korttidsgränsvärde ska användas som ett rekommenderat högsta värde som inte bör överskridas)
Regulatory reference	Hygieniska gränsvärden (AFS 2015:7)
8.2. Exposure controls	
<b>Hand protection:</b>	
Leather protective gloves. Nitrile-rubber protective gloves. VITON gloves	
<b>Eye protection:</b>	
Safety glasses with side shields	
<b>Skin and body protection:</b>	
Majority cotton protective clothing	
<b>Respiratory protection:</b>	
In the event of insufficient ventilation: Gas mask with filter type AX. In a confined area : Self-contained breathing apparatus	

## 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

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pH	: Not applicable
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: No data available
Freezing point	: No data available
Boiling point	: -51 °C
Flash point	: Not applicable
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Extremely flammable gas.
Vapour pressure	: 15.86 bar (25°C)
Vapour pressure at 50 °C	: 29.31 bar (50°C)
Relative vapour density at 20 °C	: 3.623
Relative density	: No data available
Density	: 0.99 g/cm <sup>3</sup> (25°C)
Solubility	: No data available
Log Pow	: No data available
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)	: 12 vol %
Upper explosive limit (UEL)	: 23.3 vol %

### 9.2. Other information

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 toxicological effects

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

#### Difluoromethane (75-10-5)

LC50 inhalation rat (ppm)	> 520000 ppm/4h
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#### 2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)

LC50 inhalation rat (ppm)	> 400000 ppm/4h
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#### Pentafluoroethane (354-33-6)

LC50 inhalation rat (ppm)	800000 ppm/4h
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Skin corrosion/irritation	: Not classified pH: Not applicable
Additional information	: Contact with the liquid causes frostbite

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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

### Difluoromethane (75-10-5)

NOAEC (inhalation, rat, gas, 90 days)	50000 ppmv/6h/day
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Aspiration hazard : Not classified

## SECTION 12: Ecological information

### 12.1. Toxicity

Acute aquatic toxicity	: Not classified
Chronic aquatic toxicity	: Not classified

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

LC50 fish 1	> 197 mg/l Cyprinus carpio (Common carp)
EC50 Daphnia 1	> 83 mg/l (Daphnia magna)
EC50 72h algae (1)	> 100 mg/l (scenedesmus capricornutum)

### Pentafluoroethane (354-33-6)

LC50 fish 1	> 100 mg/l 96 Hours (Oncorhynchus mykiss)
EC50 Daphnia 1	> 100 mg/l 48 Hours (Daphnia magna)
EC50 72h algae (1)	> 114 mg/l 72 Hours (Pseudokirchneriella subcapitata)

### 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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#### Pentafluoroethane (354-33-6)

Persistence and degradability	5 % biodegradation after 28 days.
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### 12.3. Bioaccumulative potential

#### Difluoromethane (75-10-5)

Log Pow	0.21
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#### 2,3,3,3-Tetrafluoroprop-1-ene (754-12-1)

Log Pow	2.15
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#### Pentafluoroethane (354-33-6)

Log Pow	1.48
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### 12.4. Mobility in soil

#### Pentafluoroethane (354-33-6)

Log Koc	1.3 - 1.7
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### 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
Pentafluoroethane (354-33-6)	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. Other adverse effects

Other adverse effects : Ozone depletion factor ODP (R-11=1) = 0. Total global warming potential (GWP) : 698.




## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Regional legislation (waste) : 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. 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 / IATA / IMDG

ADR	IMDG	IATA
<b>14.1. UN 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 ; Difluoromethane ; 2,3,3,3-Tetrafluoroprop-1-ene ; Pentafluoroethane)	LIQUEFIED GAS, FLAMMABLE, N.O.S. (Difluoromethane ; 2,3,3,3-Tetrafluoroprop-1-ene ; Pentafluoroethane)	Liquefied gas, flammable, n.o.s. (Difluoromethane ; 2,3,3,3-Tetrafluoroprop-1-ene ; Pentafluoroethane)
<b>Transport document description</b>		
UN 3161 LIQUEFIED GAS, FLAMMABLE, N.O.S. (2,3,3,3-Tetrafluoroprop-1-ene ; Difluoromethane ; 2,3,3,3-Tetrafluoroprop-1-ene ; Pentafluoroethane), 2.1. (B/D)	UN 3161 LIQUEFIED GAS, FLAMMABLE, N.O.S. (Difluoromethane ; 2,3,3,3-Tetrafluoroprop-1-ene ; Pentafluoroethane), 2.1	UN 3161 Liquefied gas, flammable, n.o.s. (Difluoromethane ; 2,3,3,3-Tetrafluoroprop-1-ene ; Pentafluoroethane), 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



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

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

Contains no REACH substances with Annex XVII restrictions  
Contains no substance on the REACH candidate list  
Contains no REACH Annex XIV substances  
Contains no substance 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.  
Contains no substance 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

Reference to AwSV : Water hazard class (WGK) 1, Slightly hazardous to water (Classification according to AwSV, Annex 1)  
12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

##### Netherlands

SZW-lijst van kankerverwekkende stoffen : None of the components are listed  
SZW-lijst van mutagene stoffen : None of the components are listed  
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : None of the components are listed  
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : None of the components are listed  
NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Ontwikkeling : None of the components are listed

##### Switzerland

Swiss National Regulations : ORRChim RS 814.81.

### 15.2. Chemical safety assessment

No additional information available



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### SECTION 16: Other information

Indication of changes:			
Section	Changed item	Change	Comments
5.2	Hazardous decomposition products in case of fire	Added	
7.1	Precautions for safe handling	Added	
10.5	Incompatible materials	Added	

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 1	Flammable gases, Category 1
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
H220	Extremely flammable 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.*