

## SAFETY DATA SHEET

**SOLKATHERM® SES 36**

Revision Date 22.04.2016

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

- Trade name SOLKATHERM® SES 36

**1.2 Relevant identified uses of the substance or mixture and uses advised against****Uses of the Substance/Mixture**

- Heat transfer medium
- Refrigerant
- Solvent

**1.3 Details of the supplier of the safety data sheet****Company**

SOLVAY CHEMICALS INTERNATIONAL SA  
RUE DE RANSBEEK, 310  
1120, BRUXELLES  
BELGIUM  
Tel: +32-2-5096111  
Fax: +32-2-5096624

**E-mail address**

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74400 Saint Thibault des Vignes  
France

 +33 (0) 164 308 922

 +33 (0) 164 308 749

 hse@service-chimie.fr

 www.service-chimie.fr

**1.4 Emergency telephone number**

+44(0)1235 239 670 [CareChem 24]

**SECTION 2: Hazards identification****2.1 Classification of the substance or mixture****Classification (Regulation (EC) No 1272/2008 )**

- Not classified as hazardous product under the regulation above.

**2.2 Label elements****|| Regulation (EC) No 1272/2008**

- || - Not labelled as hazardous product under the above regulation.

**Additional Labeling**

- || - EUH018 In use may form flammable/explosive vapour-air mixture.

**2.3 Other hazards which do not result in classification**

- None known.

**SECTION 3: Composition/information on ingredients****3.1 Substance**

- Not applicable, this product is a mixture.

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**3.2 Mixture**

- Chemical name 1,1,1,3,3-Pentafluorobutane (= HFC-365mfc) / 1-Propene, 1,1,2,3,3,3-hexafluoro-, oxidized, polymd. (= Galden ® HT55)

**Information on Components and Impurities**

| Chemical name  | Identification number   | Classification Regulation (EC) No 1272/2008 | Concentration [%] |
|--|---|---|-------------------|
| 1,1,1,3,3-pentafluorobutane                                  | Index-No. :<br>602-102-00-6<br><br>CAS-No. :<br>406-58-6<br><br>ELINCS No. :<br>430-250-1         | Flammable liquids, Category 2 ;<br>H225     | >= 60 - < 70      |
| Other substances with occupational exposure limits           |   |   |                   |
| Hexafluoropropene, oxidized, oligomers, reduced, fluorinated | CAS-No. :<br>161075-00-9<br><br>Registration number: 01-2119970717-25-0000<br>self classification | Not classified                              | >= 30 - < 40      |

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**
**In case of inhalation**

- Remove to fresh air.
- Oxygen or artificial respiration if needed.
- If symptoms persist, call a physician.

**In case of skin contact**

- Wash off with soap and water.
- If symptoms persist, call a physician.

**In case of eye contact**

- Rinse thoroughly with plenty of water, also under the eyelids.
- If eye irritation persists, consult a specialist.

**In case of ingestion**

- Clean mouth with water and drink afterwards plenty of water.
- If symptoms persist, call a physician.

**4.2 Most important symptoms and effects, both acute and delayed**
**In case of inhalation**
**Symptoms**

- narcosis
- At high concentrations:
- Asphyxia

**In case of skin contact**
**Effects**

- Prolonged skin contact may defat the skin and produce dermatitis.

**In case of eye contact**
**Effects**

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- slight irritation

**In case of ingestion****Effects**

- Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhoea.

**4.3 Indication of any immediate medical attention and special treatment needed****Notes to physician**

- Indication of immediate medical attention and special treatment needed, if necessary

**SECTION 5: Firefighting measures****5.1 Extinguishing media****Suitable extinguishing media**

- Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media**

- none

**5.2 Special hazards arising from the substance or mixture****Specific hazards during firefighting**

- The product is not flammable.
- In use, may form flammable/explosive vapour-air mixture.

**Hazardous combustion products:**

- The release of other hazardous decomposition products is possible.

**5.3 Advice for firefighters****Special protective equipment for firefighters**

- Wear self-contained breathing apparatus and protective suit.
- Full protective flameproof clothing
- Wear chemical resistant oversuit
- Special protective actions for fire-fighters
- In case of fire, use water spray.
- Keep product and empty container away from heat and sources of ignition.
  
- Fire fighters must wear fire resistant personnel protective equipment.
- Protect intervention team with a water spray as they approach the fire.
- Clean contaminated surface thoroughly.

**Further information**

- Evacuate personnel to safe areas.
- Keep containers and surroundings cool with water spray.
- Approach from upwind.

**SECTION 6: Accidental release measures****6.1 Personal precautions, protective equipment and emergency procedures****Advice for non-emergency personnel**

- Prevent further leakage or spillage if safe to do so.
- Keep away from incompatible products
  
- Ventilate the area.
- Keep away from open flames, hot surfaces and sources of ignition.

**Advice for emergency responders**

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- Approach from upwind.
- Vapours are heavier than air and can cause suffocation by reducing oxygen available for breathing.
- Suppress (knock down) gases/vapours/mists with a water spray jet.
- Avoid spraying the leak source.

**6.2 Environmental precautions**

- Should not be released into the environment.
- If the product contaminates rivers and lakes or drains inform respective authorities.

**6.3 Methods and materials for containment and cleaning up**

- Dam up.
- Soak up with inert absorbent material.
- Prevent product from entering sewage system.
- Keep in properly labelled containers.
- Keep in suitable, closed containers for disposal.
  
- Treat recovered material as described in the section "Disposal considerations".

**6.4 Reference to other sections**

- Refer to protective measures listed in sections 7 and 8.

**SECTION 7: Handling and storage****7.1 Precautions for safe handling**

- Used in closed system
- Use only in well-ventilated areas.
- Keep away from heat and sources of ignition.
- Heating can release vapours which can be ignited.
- To avoid ignition of vapours by static electricity discharge, all metal parts of the equipment must be grounded.
- When transferring from one container to another apply earthing measures and use conductive hose material.
- Preferably transfer by pump or gravity.
- Do not use sparking tools.
- Keep away from incompatible products
  
- Use only equipment and materials which are compatible with the product.
- Prevent any product decomposition from contacting hot spots.

**Hygiene measures**

- Use only in an area equipped with a safety shower.
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using do not eat, drink or smoke.
- Gloves, overalls and boots have to be double layered (protection against cold temperature).
- Handle in accordance with good industrial hygiene and safety practice.

**7.2 Conditions for safe storage, including any incompatibilities**

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**Technical measures/Storage conditions**

- Store in original container.
- Keep container closed.
- Keep in a cool, well-ventilated place.
- Keep in a banded area.
- Keep away from heat/sparks/open flames/hot surfaces. No smoking.
- Ensure all equipment is electrically grounded before beginning transfer operations.
- Take measures to prevent the build up of electrostatic charge.
  
- Keep away from heat and sources of ignition.
  
- Keep away from:
- Incompatible products
  
- Ensure all equipment is electrically grounded before beginning transfer operations.

**Packaging material**
**Suitable material**

- Steel drum

**7.3 Specific end use(s)**

- Contact your supplier for additional information

**SECTION 8: Exposure controls/personal protection**
**8.1 Control parameters**
**Components with workplace occupational exposure limits**

| Components   | Value type | Value   | Basis                            |
|--|------------|---------|----------------------------------|
| Hexafluoropropene, oxidized, oligomers, reduced, fluorinated | TWA        | 555 ppm | Solvay Acceptable Exposure Limit |

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**Derived No Effect Level (DNEL) / Derived minimal effect level (DMEL)**

| Product name   | Population         | Route of exposure | Potential health effects | Exposure time | Value             | Remarks |
|--|--------------------|-------------------|--------------------------|---------------|-------------------|---------|
| 1,1,1,3,3-pentafluorobutane                                  | Workers            | Dermal            | Systemic effects         | Long term     | 9940 mg/kg        |         |
|  | Workers            | Inhalation        | Systemic effects         | Long term     | 4053 mg/m3        |         |
|  | General population | Dermal            | Systemic effects         | Long term     | 2982 mg/kg        |         |
|  | General population | Inhalation        | Systemic effects         | Long term     | 605 mg/m3         |         |
|  | General population | Oral              | Systemic effects         | Long term     | 3 mg/kg           |         |
| Hexafluoropropene, oxidized, oligomers, reduced, fluorinated | Workers            | Inhalation        | Systemic effects         | Long term     | 2315 mg/m3        |         |
|  | Workers            | Dermal            | Systemic effects         | Long term     | 3.33 mg/kg bw/day |         |
|  | General population | Inhalation        | Systemic effects         | Long term     | 576 mg/m3         |         |
|  | General population | Dermal            | Systemic effects         | Long term     | 1.67 mg/kg bw/day |         |

**Predicted No Effect Concentration ( PNEC )**

| Product name                | Compartment              | Value       | Remarks |
|-----------------------------|--------------------------|-------------|---------|
| 1,1,1,3,3-pentafluorobutane | Fresh water              | 1.2 mg/l    |         |
|                             | Marine water             | 0.12 mg/l   |         |
|                             | Marine sediment          | 0.737 mg/kg |         |
|                             | Fresh water sediment     | 7.37 mg/kg  |         |
|                             | Soil                     | 0.823 mg/kg |         |
|                             | Sewage treatment plant   | 5.95 mg/l   |         |
|                             | Intermittent use/release | 1.14 mg/l   |         |

**8.2 Exposure controls**
**Control measures**
**Engineering measures**

- Provide appropriate exhaust ventilation at machinery.
- Apply technical measures to comply with the occupational exposure limits.
- Refer to protective measures listed in sections 7 and 8.

**Individual protection measures**
**Respiratory protection**

- Self-contained breathing apparatus in confined spaces/insufficient oxygen/in case of large uncontrolled emissions/in all circumstances when the mask and cartridge do not give adequate protection.
- Use only respiratory protection that conforms to international/ national standards.
- Recommended Filter type: AX
- In the case of vapour formation use a respirator with an approved filter.

**Hand protection**

- Wear suitable gloves.

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**Suitable material**

- PVA
- Copolymer VF2-HFP (fluoroelastomer)
  
- Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact).

**Eye protection**

- Chemical resistant goggles must be worn.

**Skin and body protection**

- Wear suitable protective clothing.

**Hygiene measures**

- Use only in an area equipped with a safety shower.
- Eye wash bottles or eye wash stations in compliance with applicable standards.
- When using do not eat, drink or smoke.
- Gloves, overalls and boots have to be double layered (protection against cold temperature).
- Handle in accordance with good industrial hygiene and safety practice.

**Environmental exposure controls**

- Dispose of rinse water in accordance with local and national regulations.

**SECTION 9: Physical and chemical properties**
**9.1 Information on basic physical and chemical properties**

|   |                 |  |
|---|-----------------|--|
| <b><u>Appearance</u></b>                              | Form:           | Volatile.  |
|   | Physical state: | liquid   |
|   | Colour:         | colourless   |
| <b><u>Odour</u></b>                                   |                 | ether-like   |
| <b><u>Odour Threshold</u></b>                         |                 | no data available  |
| <b><u>pH</u></b>                                      |                 | 6.0  |
| <b><u>Melting point/freezing point</u></b>            |                 | no data available  |
| <b><u>Initial boiling point and boiling range</u></b> |                 | Boiling point/boiling range: 36.7 °C                                     |
| <b><u>Flash point</u></b>                             |                 | does not flash   |
| <b><u>Evaporation rate (Butylacetate = 1)</u></b>     |                 | no data available  |
| <b><u>Flammability (solid, gas)</u></b>               |                 | Not applicable   |
| <b><u>Flammability (liquids)</u></b>                  |                 | The product is not flammable.<br><br>Can become highly flammable in use. |

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|  |  |
|--|--|
| <b><u>Flammability/Explosive limit</u></b>           | <p><u>Lower flammability/explosion limit:</u><br/>Type: Lower explosion limit<br/>3.90 %(V)</p> <p><u>Upper flammability/explosion limit:</u><br/>Type: Upper explosion limit<br/>11.70 %(V)</p> <p><u>Explosiveness:</u><br/>In use, may form flammable/explosive vapour-air mixture.</p> |
| <b><u>Auto-ignition temperature</u></b>              | 580 °C<br>1,1,1,3,3-pentafluorobutane  |
| <b><u>Vapour pressure</u></b>                        | 500 hPa ( 20 °C)   |
| <b><u>Vapour density</u></b>                         | > 1 ( 20 °C)   |
| <b><u>Density</u></b>                                | <u>Bulk density:</u> Not applicable  |
| <b><u>Relative density</u></b>                       | 1.37   |
| <b><u>Solubility</u></b>                             | no data available  |
| <b><u>Partition coefficient: n-octanol/water</u></b> | log Pow: 1.6<br>1,1,1,3,3-pentafluorobutane  |
| <b><u>Decomposition temperature</u></b>              | >= 200 °C  |
| <b><u>Viscosity</u></b>                              | <u>Viscosity, dynamic :</u> 0.4 mPa.s ( 25 °C)   |
| <b><u>Explosive properties</u></b>                   | no data available  |
| <b><u>Oxidizing properties</u></b>                   | Not considered as oxidizing  |

**9.2 Other information**

|                                |   |
|--------------------------------|---|
| <b><u>Henry's Constant</u></b> | ca. 3800 Pa.m <sup>3</sup> /mol (20 °C)<br>Method: Calculation method<br>considerable volatility, Air |
|--------------------------------|---|

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

- Risk of violent reaction.
- Risk of explosion.

**10.2 Chemical stability**

- Stable under recommended storage conditions.

**10.3 Possibility of hazardous reactions**

- Strong oxidizers, alkali metals and alkaline earth metals may cause fires or explosions.

**10.4 Conditions to avoid**

- Heat, flames and sparks.

**10.5 Incompatible materials**

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- Light and/or alkaline metals
- Powdered metals
- Alkaline earth metals

**10.6 Hazardous decomposition products**

- Gaseous hydrogen fluoride (HF).
- Fluorophosgene
- The release of other hazardous decomposition products is possible.

**SECTION 11: Toxicological information**
**11.1 Information on toxicological effects**
**Acute toxicity**
**Acute oral toxicity**
 1,1,1,3,3-pentafluorobutane

LD50 : &gt; 2,000 mg/kg - Rat , male and female

Method: OECD Test Guideline 401


Not classified as hazardous for acute oral toxicity according to GHS.

 Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

LD50 : &gt; 5,000 mg/kg - Rat , male and female

Method: OECD Test Guideline 401

Unpublished internal reports

**Acute inhalation toxicity**
 1,1,1,3,3-pentafluorobutane

LC50 - 4 h ( vapour ) : &gt; 100,000 ppm - Rat , male and female

Not classified as hazardous for acute inhalation toxicity according to GHS.

 Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

LC50 - 4 h ( vapour ) : &gt; 1,627 mg/l - Rat , male and female

Method: OECD Test Guideline 403

Unpublished internal reports

**Acute dermal toxicity**

 Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

LD50 : &gt; 2,000 mg/kg - Rat , male and female

Method: OECD Test Guideline 402

Unpublished internal reports

**Acute toxicity (other routes of administration)**

no data available

**Skin corrosion/irritation**
 1,1,1,3,3-pentafluorobutane

Rabbit

No skin irritation

Method: OECD Test Guideline 404

 Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

Rabbit

No skin irritation

Method: OECD Test Guideline 404

Unpublished internal reports

**Serious eye damage/eye irritation**
 1,1,1,3,3-pentafluorobutane

Rabbit

No eye irritation

Method: OECD Test Guideline 405

 Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

Rabbit

No eye irritation

Method: OECD Test Guideline 405

Unpublished internal reports

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**Respiratory or skin sensitisation****1,1,1,3,3-pentafluorobutane**Maximisation Test - Guinea pig  
Does not cause skin sensitisation.  
Method: OECD Test Guideline 406Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinatedBuehler Test - Guinea pig  
Does not cause skin sensitisation.  
Method: OECD Test Guideline 406  
Unpublished internal reports**Mutagenicity****Genotoxicity in vitro****1,1,1,3,3-pentafluorobutane**

In vitro tests did not show mutagenic effects

Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

By analogy

Ames test  
with and without metabolic activationnegative  
Method: OECD Test Guideline 471  
Unpublished internal reports

By analogy

Chromosome aberration test in vitro  
with and without metabolic activationnegative  
Method: OECD Test Guideline 473  
Unpublished internal reports**Genotoxicity in vivo****1,1,1,3,3-pentafluorobutane**

In vivo tests did not show mutagenic effects

Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

By analogy

In vivo micronucleus test - Rat  
male  
Oral  
Method: OECD Test Guideline 474negative  
Unpublished internal reports**Carcinogenicity**

no data available

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**Toxicity for reproduction and development**
**Toxicity to reproduction/Fertility**

1,1,1,3,3-pentafluorobutane

 One-Generation Reproduction Toxicity Study - Rat , male and female  
 Inhalation  
 NOAEL parent: 30,000 ppm(m)  
 Method: OECD Test Guideline 415

**Developmental Toxicity/Teratogenicity**

1,1,1,3,3-pentafluorobutane

 Rat , female  
 Application Route: Inhalation  
 NOAEC teratogenicity: 30,000 ppm(m)  
 Method: OECD Test Guideline 414  
 no embryotoxic or teratogenic effects have been observed

 Rabbit , female  
 Application Route: Inhalation  
 NOAEC teratogenicity: 30,000 ppm(m)

 Method: OECD Test Guideline 414  
 no embryotoxic or teratogenic effects have been observed

 Hexafluoropropene, oxidized,  
 oligomers, reduced, fluorinated

By analogy

 Rat  
 Application Route: Inhalation  
 Method: OECD Test Guideline 414  
 no embryotoxic or teratogenic effects have been observed  
 Unpublished internal reports

**STOT**
**STOT - single exposure**

1,1,1,3,3-pentafluorobutane

The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.

 Hexafluoropropene, oxidized,  
 oligomers, reduced, fluorinated

The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.

**STOT - repeated exposure**

1,1,1,3,3-pentafluorobutane

The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.

 Hexafluoropropene, oxidized,  
 oligomers, reduced, fluorinated

The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.

1,1,1,3,3-pentafluorobutane

 Inhalation Single exposure - Dog  
 LOAEL: 75100 ppm  
 cardiac sensitization following adrenergic stimulation

 Inhalation 1-year - Rat , male and female  
 NOAEC: 6980 ppm  
 Target Organs: Liver, Kidney

 Hexafluoropropene, oxidized,  
 oligomers, reduced, fluorinated

 Oral 28-day - Rat , male and female  
 NOEL: 1000 mg/kg  
 Method: OECD Test Guideline 407  
 Unpublished internal reports

By analogy

Inhalation (vapour) 28-day - Rat , male and female

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NOEC: 11.62 mg/l  
Method: OECD Test Guideline 412  
No significant adverse effects were reported  
Unpublished internal reports

By analogy

Inhalation (vapour) 90-day - Rat , male  
NOEC: 11.59 mg/l  
Method: OECD Test Guideline 413  
No significant adverse effects were reported  
Unpublished internal reports

**CMR effects****Mutagenicity**

Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

The product is considered to be non-mutagenic based on an overall assessment of the data from animal and/or in vitro testing.

**Teratogenicity**

Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

Animal testing did not show any effects on foetal development.

**Aspiration toxicity**

Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

No aspiration toxicity classification

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**SECTION 12: Ecological information**
**12.1 Toxicity**
**Aquatic Compartment**
**Acute toxicity to fish**

1,1,1,3,3-pentafluorobutane

 LC50 - 96 h : > 200 mg/l - Danio rerio (zebra fish)  
 semi-static test

 Method: OECD Test Guideline 203  
 Not harmful to fish (LC50 > 100 mg/L)

 Hexafluoropropene, oxidized,  
 oligomers, reduced, fluorinated

 - 96 h : - Danio rerio (zebra fish)  
 semi-static test  
 Analytical monitoring: yes

 Method: OECD Test Guideline 203  
 No toxicity at the limit of solubility  
 Unpublished internal reports

**Acute toxicity to daphnia and other aquatic invertebrates.**

1,1,1,3,3-pentafluorobutane

 EC50 - 48 h : > 200 mg/l - Daphnia magna (Water flea)  
 static test

 Method: OECD Test Guideline 202  
 Not harmful to aquatic invertebrates. (EC50 > 100 mg/L)

 Hexafluoropropene, oxidized,  
 oligomers, reduced, fluorinated

 EC50 - 48 h : - Daphnia magna (Water flea)  
 semi-static test  
 Analytical monitoring: yes  
 Method: OECD Test Guideline 202  
 No toxicity at the limit of solubility  
 Unpublished internal reports

**Toxicity to aquatic plants**

1,1,1,3,3-pentafluorobutane

 NOEC - 72 h : 13.2 mg/l - Pseudokirchneriella subcapitata (green algae)  
 static test  
 Method: OECD Test Guideline 201  
 Not harmful to algae (EC50 > 100 mg/L)

 EC50 - 72 h : > 114 mg/l - Pseudokirchneriella subcapitata (green algae)  
 static test  
 Method: OECD Test Guideline 201  
 Not harmful to algae (EC50 > 100 mg/L)

 Hexafluoropropene, oxidized,  
 oligomers, reduced, fluorinated

 - 72 h : - Pseudokirchneriella subcapitata (green algae)  
 Analytical monitoring: yes  
 Method: OECD Test Guideline 201  
 No toxicity at the limit of solubility  
 Unpublished internal reports

**Toxicity to microorganisms**

1,1,1,3,3-pentafluorobutane

 EC50 - 3 h : > 595 mg/l - activated sludge  
 static test

 Hexafluoropropene, oxidized,  
 oligomers, reduced, fluorinated

 NOEC - 3 h : 1,000 mg/l - activated sludge  
 Analytical monitoring: no  
 Method: OECD Test Guideline 209  
 Unpublished internal reports

**Chronic toxicity to fish**

1,1,1,3,3-pentafluorobutane

NOEC: ca. 38.2 mg/l - 30 Days - Pimephales promelas (fathead minnow)

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Method: Calculation method

**Chronic toxicity to daphnia and other aquatic invertebrates.**

no data available

**Chronic Toxicity to aquatic plants**

no data available

**Terrestrial Compartment****Toxicity to terrestrial plants**

1,1,1,3,3-pentafluorobutane

NOEC: &gt;= 6,000 g/l

End point: Growth rate

**12.2 Persistence and degradability****Abiotic degradation****Stability in water**

1,1,1,3,3-pentafluorobutane

Hydrolysis  
not significant, Medium, Water**Photodegradation**

1,1,1,3,3-pentafluorobutane

indirect photo-oxidation  
Half-life indirect photolysis: ca. 10.8 y  
Air**Physical- and photo-chemical elimination**

no data available

**Biodegradation****Biodegradability**

1,1,1,3,3-pentafluorobutane

aerobic  
Method: Closed Bottle test  
2 % - 28 Days  
The substance does not fulfill the criteria for ready biodegradability and ultimate aerobic biodegradabilityHexafluoropropene, oxidized,  
oligomers, reduced, fluorinatedThe substance does not fulfill the criteria for ready biodegradability and ultimate aerobic biodegradability  
Structure-activity relationship (SAR)**Degradability assessment**Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

The product is not considered to be rapidly degradable in the environment

**12.3 Bioaccumulative potential****Partition coefficient: n-octanol/water**

1,1,1,3,3-pentafluorobutane

Not potentially bioaccumulable

**Bioconcentration factor (BCF)**

1,1,1,3,3-pentafluorobutane

Does not bioaccumulate.

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**12.4 Mobility in soil**
**Adsorption potential (Koc)**

1,1,1,3,3-pentafluorobutane

 Adsorption  
Soil/sediments  
Koc: ca. 9  
not significant

 Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

 Adsorption/Soil  
Koc: 1000 - 10000  
Method: OECD Test Guideline 106  
Unpublished internal reports

**Known distribution to environmental compartments** no data available

**12.5 Results of PBT and vPvB assessment**

1,1,1,3,3-pentafluorobutane

 This substance is not considered to be persistent, bioaccumulating and toxic (PBT).  
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

**12.6 Other adverse effects**
**Ozone-Depletion Potential**

 Ozone-Depletion Potential: 0  
Additional Information: no effect on stratospheric ozone  
Ozone depletion potential; ODP; (R-11 = 1)

**Ecotoxicity assessment**
**Acute aquatic toxicity**

 Hexafluoropropene, oxidized,  
oligomers, reduced, fluorinated

No toxicity at the limit of solubility

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

- In accordance with local and national regulations.
- The incinerator must be equipped with a system for the neutralisation or recovery of HF.
- Refer to manufacturer/supplier for information on recovery/recycling.

**Advice on cleaning and disposal of packaging**

- To avoid treatments, as far as possible, use dedicated containers.
- Where possible recycling is preferred to disposal or incineration.

**SECTION 14: Transport information**
**ADR**

not regulated

**RID**

not regulated

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**IMDG**

not regulated

**IATA**

not regulated

**ADN/ADNR**

not regulated

Note: The above regulatory prescriptions are those valid on the date of publication of this sheet. Given the possible evolution of transport regulations for hazardous materials, it would be advisable to check their validity with your sales office.

**SECTION 15: Regulatory information**
**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
**Other regulations**

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), as amended
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, as amended
- Council Directive 98/24/EC of 7 April 1998 on the protection of the health and safety of workers from the risks related to chemical agents at work, as amended

**Notification status**

| Inventory Information  | Status  |
|--|---|
| United States TSCA Inventory   | - Listed on Inventory<br>- CAS: 69991-67-9  |
| Canadian Domestic Substances List (DSL)  | - Listed on Inventory<br>- CAS: 69991-67-9  |
| Australia Inventory of Chemical Substances (AICS)  | - Listed on Inventory<br>- CAS: 69991-67-9  |
| Philippines Inventory of Chemicals and Chemical Substances (PICCS)                       | - One or more components not listed on inventory  |
| Korea. Korean Existing Chemicals Inventory (KECI)  | - Listed on Inventory<br>- CAS: 69991-67-9  |
| China. Inventory of Existing Chemical Substances in China (IECSC)                        | - Listed on Inventory<br>- CAS: 69991-67-9  |
| Japan. CSCL - Inventory of Existing and New Chemical Substances                          | - Listed on Inventory<br>- CAS: 69991-67-9  |
| New Zealand. Inventory of Chemical Substances  | - Listed on Inventory<br>- CAS: 69991-67-9  |
| Taiwan. Chemical Substance Inventory (TCSI)  | - Listed on Inventory<br>- CAS: 69991-67-9  |
| EU. European Registration, Evaluation, Authorisation and Restriction of Chemical (REACH) | - If product is purchased from Solvay in Europe it is in compliance with REACH, if not please contact the supplier. |

**15.2 Chemical safety assessment**

- None

**SECTION 16: Other information**
**Full text of H-Statements referred to under sections 2 and 3.**

- H225 Highly flammable liquid and vapour.

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**Further information**

- Distribute new edition to clients

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. Such information is only given as a guidance to help the user handle, use, process, store, transport, dispose and release the product in satisfactory safety conditions and is not to be considered as a warranty or quality specification. It should be used in conjunction with technical sheets but do not replace them. Thus, the information only relates to the designated specific product and may not be applicable if such product is used in combination with other materials or in any other manufacturing process, unless otherwise specifically indicated. It does not release the user from ensuring he is in conformity with all regulations linked to its activity.

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