

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

- Trade name GALDEN® LS230

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

- Heat transfer medium
- For industrial use only

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

SOLVAY SPECIALTY POLYMERS ITALY S.p.A.  
VIALE LOMBARDIA, 20  
20021, BOLLATE  
ITALIA  
Tel: +39-02-290921

**E-mail address**

sds.solvay@solvay.com

**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.

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

- Thermal decomposition can lead to release of toxic and corrosive gases.

**Ecological information**

- 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.

**Toxicological information**

- 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 Substance**

- Chemical nature Perfluorinated polyethers

**Information on Components and Impurities**

Chemical name	Identification number	Concentration [%]
1-Propene, 1,1,2,3,3,3-hexafluoro-, oxidized, polymd.	CAS-No. : 69991-67-9	> 99,9

**3.2 Mixture**

- Not applicable, this product is a substance.

**SECTION 4: First aid measures****4.1 Description of first aid measures****In case of inhalation**

- Move to fresh air in case of accidental inhalation of fumes from overheating or combustion.
- Oxygen or artificial respiration if needed.

**In case of skin contact**

- Wash off with soap and water.

**In case of eye contact**

- Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.
- If eye irritation persists, consult a specialist.

**In case of ingestion**

- Drink 1 or 2 glasses of water.
- Do NOT induce vomiting.
- If symptoms persist, call a physician.

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

- No known effect.

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

- Effects of skin contacts may include:
- Redness

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

- Contact with eyes may cause irritation.
- Redness

**In case of ingestion****Symptoms**

- Ingestion may provoke the following symptoms:
- Nausea
- Vomiting
- Diarrhoea

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

- None

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

- Water
- powder
- Foam
- Dry chemical
- Carbon dioxide (CO<sub>2</sub>)

**Unsuitable extinguishing media**

- None

**5.2 Special hazards arising from the substance or mixture**

- The product is not flammable.
- Not explosive
- In case of fire hazardous decomposition products may be produced such as: Gaseous hydrogen fluoride (HF), Fluorophosgene

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

- Wear self-contained breathing apparatus and protective suit.
- When intervention in close proximity wear acid resistant over suit.

**Further information**

- Evacuate personnel to safe areas.
- Approach from upwind.
- Protect intervention team with a water spray as they approach the fire.
- Keep containers and surroundings cool with water spray.
- Keep product and empty container away from heat and sources of ignition.

**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.

**Advice for emergency responders**

- Ensure adequate ventilation.
- Material can create slippery conditions.
- Sweep up to prevent slipping hazard.
- Keep away from open flames, hot surfaces and sources of ignition.

**6.2 Environmental precautions**

- Should not be released into the environment.
- Do not flush into surface water or sanitary sewer system.

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

- Soak up with inert absorbent material.
- Suitable material for picking up.
- Dry sand
- Earth
- Shovel into suitable container for disposal.

#### 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

- Ensure adequate ventilation.
- Use personal protective equipment.
- Keep away from heat and sources of ignition.
- To avoid thermal decomposition, do not overheat.
- Take measures to prevent the build up of electrostatic charge.
- Clean and dry piping circuits and equipment before any operations.
- Ensure all equipment is electrically grounded before beginning transfer operations.

#### Hygiene measures

- Ensure that eyewash stations and safety showers are close to the workstation location.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- Handle in accordance with good industrial hygiene and safety practice.

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

#### Technical measures/Storage conditions

- Keep away from heat and sources of ignition.
- Keep in properly labelled containers.
- Keep away from combustible material.
- Keep away from incompatible products
- Provide tight electrical equipment well protected against corrosion.
- Refer to protective measures listed in sections 7 and 8.

#### Packaging material

##### **Suitable material**

- Plastic materials.
- glass

### 7.3 Specific end use(s)

- Product degradation was not observed in VPS application.
- Contact your supplier for additional information

## SECTION 8: Exposure controls/personal protection

### 8.1 Control parameters

**Threshold limit values of by-products from thermal decomposition:****Components with workplace occupational exposure limits**

Components	Value type	Value	Basis
hydrogen fluoride	TWA	1,8 ppm	Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
		1,5 mg/m3	
hydrogen fluoride	STEL	3 ppm	Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
		2,5 mg/m3	
hydrogen fluoride	TWA	0,5 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Danger of cutaneous absorption Expressed as :Fluorine	
hydrogen fluoride	C	2 ppm	USA. ACGIH Threshold Limit Values (TLV)
		Danger of cutaneous absorption Expressed as :Fluorine	
carbonyl difluoride	TWA	2,5 mg/m3	Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
		Expressed as :Fluorine	
carbonyl difluoride	TWA	2 ppm	USA. ACGIH Threshold Limit Values (TLV)
carbonyl difluoride	STEL	5 ppm	USA. ACGIH Threshold Limit Values (TLV)

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

- Provide local ventilation appropriate to the product decomposition risk (see section 10).
- Refer to protective measures listed in sections 7 and 8.
- Apply technical measures to comply with the occupational exposure limits.

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

- In case of decomposition (see section 10), use an air breathing apparatus with face mask.
- Self-contained open-circuit compressed air breathing apparatus (EN 137)
- Self-contained closed-circuit breathing apparatus compressed (EN 145)

**Hand protection**

- Protective gloves complying with EN 374.

**Suitable material**

- Nitrile rubber
  - PVC
  - Neoprene gloves
  - butyl-rubber
- 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**

- Safety goggles
- Use eye protection according to EN 166.

**Skin and body protection**

- Wear work overall and safety shoes.

**Hygiene measures**

- Ensure that eyewash stations and safety showers are close to the workstation location.
- When using do not eat, drink or smoke.
- Wash hands before breaks and at the end of workday.
- 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>Physical state</u></b>	liquid
<b><u>Colour</u></b>	colourless
<b><u>Odour</u></b>	odourless
<b><u>Odour Threshold</u></b>	No data available
<b><u>Melting point/freezing point</u></b>	<u>Melting point/range:</u> Not applicable
<b><u>Initial boiling point and boiling range</u></b>	<u>Boiling point/boiling range:</u> 230 °C
<b><u>Flammability (solid, gas)</u></b>	The product is not flammable.
<b><u>Flammability (liquids)</u></b>	No data available
<b><u>Flammability/Explosive limit</u></b>	No data available
<b><u>Flash point</u></b>	The product is not flammable.
<b><u>Auto-ignition temperature</u></b>	No data available
<b><u>Decomposition temperature</u></b>	> 290 °C
<b><u>pH</u></b>	No data available
<b><u>Viscosity</u></b>	<u>Viscosity, dynamic</u> : ca. 8 mPa.s
<b><u>Solubility</u></b>	<u>Water solubility:</u> insoluble  <u>Solubility in other solvents:</u> Fluorinated solvents:

<b><u>Partition coefficient: n-octanol/water</u></b>	No data available
<b><u>Vapour pressure</u></b>	ca. 4,5 hPa
<b><u>Density</u></b>	1,82 g/cm <sup>3</sup> ( 20 °C)
<b><u>Relative density</u></b>	No data available
<b><u>Relative vapor density</u></b>	No data available
<b><u>Particle characteristics</u></b>	No data available
<b><u>Evaporation rate (Butylacetate = 1)</u></b>	No data available

## 9.2 Other information

<b><u>Oxidizing properties</u></b>	Not considered as oxidizing
<b><u>Self-ignition</u></b>	No data available
<b><u>Impact sensitivity</u></b>	Not explosive
<b><u>Molecular weight</u></b>	1.020 Da Polymer Molar Mass

## SECTION 10: Stability and reactivity

### 10.1 Reactivity

- No dangerous reaction known under conditions of normal use.

### 10.2 Chemical stability

- Stable under recommended storage conditions.
- Metals promote and lower decomposition temperature

### 10.3 Possibility of hazardous reactions

- No dangerous reaction known under conditions of normal use.

### 10.4 Conditions to avoid

- Avoid to use in presence of high voltage electric arc and in absence of oxygen.
- Keep away from flames and sparks.
- To avoid thermal decomposition, do not overheat.

### 10.5 Incompatible materials

- Alkali metals
- Lewis acids (Friedel-Crafts) above 100°C
- Aluminum and magnesium in powder form above 200°C

### 10.6 Hazardous decomposition products

- Gaseous hydrogen fluoride (HF).
- Fluorophosgene

## SECTION 11: Toxicological information

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

#### **Acute toxicity**

Acute oral toxicity

	By analogy Not classified as hazardous for acute oral toxicity according to GHS.
<b>Acute inhalation toxicity</b>	By analogy Not classified as hazardous for acute inhalation toxicity according to GHS.
<b>Acute dermal toxicity</b>	By analogy Not classified as hazardous for acute dermal toxicity according to GHS.
<b>Acute toxicity (other routes of administration)</b>	No data available
<b><u>Skin corrosion/irritation</u></b>	By analogy Not classified as irritating to skin
<b><u>Serious eye damage/eye irritation</u></b>	By analogy Not classified as irritating to eyes
<b><u>Respiratory or skin sensitisation</u></b>	Maximisation Test - Guinea pig Does not cause skin sensitisation. Test substance: Molecular weight ~ 1500 Unpublished internal reports
<b><u>Mutagenicity</u></b>	
<b>Genotoxicity in vitro</b>	By analogy Product is not considered to be genotoxic
<b>Genotoxicity in vivo</b>	By analogy Product is not considered to be genotoxic
<b><u>Carcinogenicity</u></b>	No data available
<b><u>Toxicity for reproduction and development</u></b>	
<b>Toxicity to reproduction/Fertility</b>	No data available
<b>Developmental Toxicity/Teratogenicity</b>	No data available
<b><u>STOT</u></b>	
<b>STOT - single exposure</b>	The substance or mixture is not classified as specific target organ toxicant, single exposure according to GHS criteria.
<b>STOT - repeated exposure</b>	No data available
<b><u>CMR effects</u></b>	
<b>Mutagenicity</b>	The product is considered to be non-mutagenic based on an overall assessment of the data from animal and/or in vitro testing. No data available
<b><u>Aspiration toxicity</u></b>	No data available
<b>11.2 Information on other hazards</b>	
<b><u>Endocrine disrupting properties</u></b>	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.
<b><u>Experience with human exposure</u></b>	No data available
<b><u>Further information</u></b>	Description of possible hazardous to health effects is based on experience and/or toxicological characteristics of several components.



Thermal decomposition can lead to release of toxic and corrosive gases.  
The exposure to decomposition products causes severe irritation of eyes, skin and mucous membranes.

## SECTION 12: Ecological information

### 12.1 Toxicity

#### Aquatic Compartment

##### Acute toxicity to fish

- 96 h : - Oncorhynchus mykiss (rainbow trout)  
static test

Test substance: Molecular weight ~ 1500  
No toxicity at the limit of solubility  
Unpublished internal reports

##### Acute toxicity to daphnia and other aquatic invertebrates

- 48 h : - Daphnia magna (Water flea)  
static test

Test substance: Molecular weight ~ 1500  
No toxicity at the limit of solubility  
Unpublished internal reports

##### Toxicity to aquatic plants

No data available

##### Toxicity to microorganisms

Pseudomonas putida  
Cell multiplication inhibition test  
Test substance: Molecular weight ~ 1500  
No toxicity at the limit of solubility  
Unpublished internal reports

##### Chronic toxicity to fish

No data available

##### Chronic toxicity to daphnia and other aquatic invertebrates

No data available

### 12.2 Persistence and degradability

#### Abiotic degradation

No data available

#### Physical- and photo-chemical elimination

No data available

#### Biodegradation

No data available

#### Degradability assessment

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

### 12.3 Bioaccumulative potential

#### Partition coefficient: n-octanol/water

No data available

#### Bioconcentration factor (BCF)

No data available

### 12.4 Mobility in soil

#### Adsorption potential (Koc)

No data available

<b>Known distribution to environmental compartments</b>	No data available
<b>12.5 Results of PBT and vPvB assessment</b>	No data available
<b>12.6 Endocrine disrupting properties</b>	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.
<b>12.7 Other adverse effects</b>	
<b>Global warming potential</b>	Regulatory basis: Regulation (EU) No 517/2014 on fluorinated greenhouse gases 100-year global warming potential: 10.300 Additional Information: ANNEX II OTHER FLUORINATED GREENHOUSE GASES SUBJECT TO REPORTING IN ACCORDANCE WITH ARTICLE 19; Section 3: Other perfluorinated compounds  Regulatory basis: Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) of the United Nations Framework Convention on Climate Change (UNFCCC) 20-year global warming potential: 7.500 100-year global warming potential: 9.710 Radiative efficiency: 0,65 Wm <sup>2</sup> ppb Additional Information: Halogenated Alcohols and Ethers
<b>Ecotoxicity assessment</b>	
<b>Short-term (acute) aquatic hazard</b>	No toxicity at the limit of solubility
<b>Remarks</b>	Ecological injuries are not known or expected under normal use.

### SECTION 13: Disposal considerations

#### 13.1 Waste treatment methods

##### Product Disposal

- Can be incinerated, when in compliance with local regulations.
- The incinerator must be equipped with a system for the neutralisation or recovery of HF.
- Dispose of in accordance with local regulations.

##### Advice on cleaning and disposal of packaging

- Empty containers can be landfilled, when in accordance with the local regulations.

### SECTION 14: Transport information

#### ADN/ADNR

not regulated

#### ADR

not regulated

**RID**

not regulated

**IMDG**

not regulated

**IATA**

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 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
- 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
- European Waste Catalogue
- Waste codes should be assigned by the user based on the application for which the product was used.

**Notification status**

<b>Inventory Information</b>	<b>Status</b>
United States TSCA Inventory	- Listed as active on the TSCA inventory
Canadian Domestic Substances List (DSL)	- Listed on Inventory
Australia Inventory of Chemical Substances (AICS)	- Listed on Inventory
Korea. Korean Existing Chemicals Inventory (KECI)	- Listed on Inventory
China. Inventory of Existing Chemical Substances in China (IECSC)	- Listed on Inventory
Japan. ISHL - Inventory of Chemical Substances	- Listed on Inventory
Japan. CSCL - Inventory of Existing and New Chemical Substances	- Listed on Inventory - This substance/mixture can only be imported by Solvay. Contact Solvay for further details.
Philippines Inventory of Chemicals and Chemical Substances (PICCS)	- Listed on Inventory
New Zealand. Inventory of Chemical Substances	- Listed on Inventory
Taiwan. Chemical Substance Inventory (TCSI)	- Listed on Inventory
EU. European Registration, Evaluation, Authorization 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**

- A Chemical Safety Assessment is not required for this substance.

**SECTION 16: Other information****Key or legend to abbreviations and acronyms used in the safety data sheet**

- C: Ceiling limit
- STEL: Short term exposure limit
- TWA: 8-hour, time-weighted average
- ADR: European Agreement on International Carriage of Dangerous Goods by Road.
- ADN: European Agreement on the International Carriage of Dangerous Goods by Inland Waterways.
- RID: European Agreement concerning the International Carriage of Dangerous Goods by Rail.
- IATA: International Air Transport Association.
- ICAO-TI: Technical Instructions for Safe Transport of Dangerous Goods by Air.
- IMDG: International Maritime Dangerous Goods.
- TWA: Time weighted average
- ATE: Estimated value of acute toxicity
- EC: European Community number
- CAS: Chemical Abstracts Service.
- LD50: Substance that causes 50% (half) death in the test animals group (Median Fatal Dose).
- LC50: Substance concentration causing 50% (half) death in the test animals group.
- EC50: Effective Concentration of the substance causing the maximum of 50%.
- PBT: Persistent, Bioaccumulative and Toxic substance.
- vPvB: Very Persistent and Very Bioaccumulative.
- GHS/CLP/SEA: Classification, labeling, packaging regulation
- DNEL: Derived No Effect Level
- PNEC: Predicted No Effect Concentration
- STOT: Specific Target Organ Toxicity

**Not all acronyms listed above are referenced in this SDS.**

NB: In this document the numerical separator of the thousands is the "." (point), the decimal separator is "," (comma).

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.