

## SAFETY DATA SHEET

Trade name:

**LEYBONOL LVO 400**

Date of issue: Oct 05, 2009

Date of revision: Sep 21, 2015

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### 1. Identification of the substance/ mixture and of the company/ undertaking

#### Product identifiers

**Trade name:** LEYBONOL LVO 400

**Product description:** Synthetic oil (perfluoropolyether PFPE, free of additives)

**Chemical characterization:** Perfluorinated polyethers

**CAS-No.:** 69991-67-9

#### Relevant identified uses of the substance or mixture and uses advised against

**Use:** Vacuum pump oil  
- Electronic industry  
- Electrical industry  
- Chemical industry  
- For industrial use only.

Order number:	Number	Package Size
	L40000	0,75 Liter
	L40001	1 Liter

#### Details of the supplier of the safety data sheet

**Supplier:** Oerlikon Leybold Vacuum GmbH  
Bonner Str. 498  
D-50968 Cologne  
Phone +49-221-347-0  
Fax +49-221-347-1250  
Internet [www.oerlikon.com/leyboldvacuum](http://www.oerlikon.com/leyboldvacuum)

**E-Mail:** [documentation.vacuum@oerlikon.com](mailto:documentation.vacuum@oerlikon.com)

**Emergency phone number:** +49/ (0)700 24112112 (OLC)

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### 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. |

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### 3. Composition/information on ingredients

#### 3.1 Substance

**Chemical nature:** Perfluorinated polyethers |

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. |

### 4. First aid measures

#### 4.1 Description of necessary 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 |

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### 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.

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### 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.

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### 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 storage, including 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:** Polyethylene

**7.3 Specific end use(s):** Contact your supplier for additional information

### 8. Exposure controls/ personal protection

**8.1 Control parameters:** Contains no substances with occupational exposure limit values above their regulatory reporting threshold.

#### 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 1,5 mg/m <sup>3</sup>	Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
	Indicative		
hydrogen fluoride	STEL	3 ppm 2,5 mg/m <sup>3</sup>	Europe. Commission Directive 2000/39/EC establishing a first list of indicative occupational exposure limit values
	Indicative		
hydrogen fluoride	TWA	0,5 ppm	USA. ACGIH Threshold Limit Values (TLV)
	Danger of cutaneous absorption Expressed as: Fluorine		

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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
Indicative 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)

**Biological Exposure Indices**

Components	Value type	Value	Basis
hydrogen fluoride	BEI	2 mg/l Fluoride Urine Prior to shift (16 hours after exposure ceases)	ACGIH - Biological Exposure Indices (BEI)
	BEI	3 mg/l Fluoride Urine End of shift (As soon as possible after exposure ceases)	ACGIH - Biological Exposure Indices (BEI)

**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.  
Use only respiratory protection that conforms to international/national standards.

**Hand protection:**

Wear protective gloves.

**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).

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<b>Eye protection:</b>	Tightly fitting safety goggles	
<b>Skin and body protection:</b>	Wear work overall and safety shoes.	
<b>Hygiene measures:</b>	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.	
<b>Environmental exposure controls:</b>	Dispose of rinse water in accordance with local and national regulations.	

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### 9. Physical and chemical properties

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

Appearance:	Physical state: liquid	
	Colour: colourless	
Odour	odourless	
Odour Threshold:	no data available	
pH:	no data available	
Melting point/range:	Not applicable.	
Boiling point/boiling range:	> 290 °C	
Flash Point	The product is not flammable.	
Evaporation rate (Butylacetate = 1):	no data available	
Flammability (liquids):	The product is not flammable.	
Flammability/Explosive limit:	no data available	
Autoignition temperature:	no data available	
Vapour pressure:	0,000002 hPa ( 20 °C)	
Vapour density:	no data available.	
Density:	1,89 g/cm3	
Relative density:	1,88 - 1,90	
Solubility(ies) :	Water solubility: insoluble	
	Solubility in other solvents:	
Partition coefficient: n-octanol/water:	Fluorinated solvents: soluble	
Thermal decomposition:	no data available	
Viscosity:	> 290 °C	
Explosive properties	Viscosity, dynamic: 280 mPa.s	
Oxidizing properties:	Not explosive	
	Not considered as oxidizing	

#### 9.2 Other information

**Molecular weight:** 2.500 Da  
Polymer Molar Mass

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### 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.

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<b>10.4 Conditions to avoid:</b>	Avoid to use in presence of high voltage electric arc and in absence of oxygen. Keep away from flames. To avoid thermal decomposition, do not overheat.
<b>10.5 Incompatible materials:</b>	Alkali metals Lewis acids (Friedel-Crafts) above 100°C Aluminum and magnesium in powder form above 200°C
<b>10.6 Hazardous decomposition products:</b>	Gaseous hydrogen fluoride (HF), Fluorophosgene

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## 11. Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

**Acute oral toxicity:** LD50: > 15.000 mg/kg - Rat , male and female  
Test substance: Molecular weight ~ 3200  
Not classified as hazardous for acute oral toxicity according to GHS.  
No significant adverse effects were reported |

**Acute inhalation toxicity:** no data available

**Acute dermal toxicity:** LD50: > 5.000 mg/kg - Rat , male and female  
Test substance: Molecular weight ~ 3200  
Not classified as hazardous for acute dermal toxicity according to GHS.  
No effect observed at this dose or concentration |

**Acute toxicity (other routes of administration):** LD50: > 5.000 mg/kg - Rat , for males and females  
Intraperitoneal route  
Test substance: Molecular weight ~ 3200 |

**Skin corrosion/irritation:** Rabbit  
Not classified as irritating to skin  
Test substance: Molecular weight ~ 3200  
2 Weeks - Rabbit  
No skin irritation  
Method: Repeated dermal application test.  
Test substance: Molecular weight ~ 3200 |

**Serious eye damage/eye irritation:** Rabbit  
Not classified as irritating to eyes  
Test substance: Molecular weight ~ 3200 |

**Respiratory or skin sensitisation:** Maximisation Test (GPMT) - Guinea pig  
Does not cause skin sensitisation.  
Test substance: Molecular weight ~ 3200 |

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**Mutagenicity**

**Genotoxicity in vitro:**

Ames test  
with and without metabolic activation

negative  
Test substance: Molecular weight ~ 3200

**Genotoxicity in vivo:**

no data available

**Carcinogenicity:**

no data available

**Toxicity for reproduction and development**

**Toxicity to reproduction/Fertility:**

no data available

**Developmental Toxicity/Teratogenicity:**

no data available

**STOT**

**STOT - single exposure:**

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

**STOT - repeated exposure:**

The substance or mixture is not classified as specific target organ toxicant, repeated exposure according to GHS criteria.  
Oral 28-day - Rat , male and female  
NOEL: 1000 mg/kg  
Test substance: Molecular weight ~ 3200  
no systemic effect observed

**CMR effects**

**Mutagenicity:**

Not mutagenic in Ames Test

**Aspiration toxicity:**

no data available

**Further information:**

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.

**12. Ecological information**

**12.1 Toxicity**

**Aquatic Compartment**

**Acute toxicity to fish:**

By analogy  
No toxicity at the limit of solubility

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

By analogy  
No toxicity at the limit of solubility



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### 12.2 Persistence and degradability

**Degradability assessment:** The product is not considered to be rapidly degradable in the environment |

**12.3 Bioaccumulative potential:** no data available

**12.4 Mobility in soil:** no data available

**12.5 Results of PBT and vPvB assessment:** no data available |

**12.6 Other adverse effects:** no data available |

### Ecotoxicity assessment

**Acute aquatic toxicity:** No toxicity at the limit of solubility |

**Remarks:** Ecological injuries are not known or expected under normal use. |

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### 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.

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### 14. Transport information

**ADR:** not regulated

**RID:** not regulated

**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. |

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### 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

Inventory Information	Status
United States TSCA Inventory	Listed on 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
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, Authorisation and Restriction of Chemical (REACH)	If product is purchased from Oerlikon Leybold Vacuum it is in compliance with REACH.

**15.2 Chemical Safety Assessment:** A Chemical Safety Assessment is not required for this substance.

### 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 Limit Value - eight hours

#### History

**Date of issue:** October 05, 2009

**Date of revision:** September 21, 2015

**Version:** A3

| Indicates information that has changed from previously issued version.

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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.

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