SAFETY DATA SHEET

LEYBONOL LVO 420

Date of issue: Oct 05, 2009
Date of revision: Sep 23, 2015

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

Product identifiers

Trade name: LEYBONOL LVO 420

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
L42001	1 Liter

Details of the supplier of the safety data sheet

Supplier:
Leybold GmbH
Bonner Strasse 498
D-50968 Cologne
Phone +49-221-347-0
Fax +49-221-347-1250
Internet www.leybold.com

E-Mail: documentation@leybold.com

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

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. |

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

5. Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media:	- Water - powder - Foam - Dry chemical - Carbon dioxide (CO2)
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.

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.

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/m3	UK. EH40 WEL - Workplace Exposure Limits
	Expressed as :Fluorine		
hydrogen fluoride	STEL	3 ppm 2,5 mg/m3	UK. EH40 WEL - Workplace Exposure Limits
	Indicative		
hydrogen fluoride	TWA	1,8 ppm 1,5 mg/m3	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/m3	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		
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	UK. EH40 WEL - Workplace Exposure Limits
	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used 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).

Eye protection:
Tightly fitting safety goggles

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.

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:	0,000013 hPa (20 °C)
Vapour density:	no data available.
Density:	1,88 g/cm3
Relative density:	1,88 - 1,90
Solubility(ies):	Water solubility: insoluble Solubility in other solvents: Fluorinated solvents: soluble
Partition coefficient: n-octanol/water:	no data available
Thermal decomposition:	> 290 °C
Viscosity:	Viscosity, dynamic: 120 mPa.s
Explosive properties	Not explosive
Oxidizing properties:	Not considered as oxidizing

9.2 Other information

Molecular weight:	1.800 Da Polymer Molar Mass

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. 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

11. Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity:	By analogy Not classified as hazardous for acute oral toxicity according to GHS.
Acute inhalation toxicity:	By analogy Not classified as hazardous for acute inhalation toxicity according to GHS.
Acute dermal toxicity:	By analogy Not classified as hazardous for acute dermal toxicity according to GHS.
Acute toxicity (other routes of administration):	no data available
Skin corrosion/irritation:	By analogy Not classified as irritating to skin
Serious eye damage/eye irritation:	By analogy Not classified as irritating to eyes
Respiratory or skin sensitisation:	Maximisation Test (GPMT) - Guinea pig Does not cause skin sensitisation. Test substance: Molecular weight ~ 1500

Mutagenicity

Genotoxicity in vitro:	By analogy Product is not considered to be genotoxic
Genotoxicity in vivo:	By analogy Product is not considered to be genotoxic
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:	no data available

CMR effects

Mutagenicity:	The product is considered to be non-mutagenic based on an overall assessment of the data from animal and/or in vitro testing.
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:	96 h: - Oncorhynchus mykiss (rainbow trout) static test Test substance: Molecular weight ~ 1500 No toxicity at the limit of solubility
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
Toxicity to microorganisms:	Pseudomonas putida Cell multiplication inhibition test Test substance: Molecular weight ~ 1500 No toxicity at the limit of solubility

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.

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.

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.

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 Leybold 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

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Version: C0

| Indicates information that has changed from previously issued version.

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

Notice to reader

This safety data sheet serves to complete but not to replace the technical product sheets. The information contained herein is given in good faith and is accurate to the best of knowledge at the date indicated above. It is understood by the user that any use of the product for purposes other than those for which it was designed entails potential risk. The information given herein in no way dispenses the user from knowing and applying all provisions regulating his activity. The user bears sole liability for the precautions required when using the product. The information contained therein is protected by copyright and must not be reproduced or amended without the express written approval of Leybold. This document may be passed on only to the extent required by law. Any dissemination of our safety datasheets (e.g. as a document for download from the Internet) beyond this legally required extent is not permitted without express written consent.