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05/2026
(replace version 02/2026)

Product information
LIPOXOL

1. Product description

Chemical name	Polyethylene glycol
Description	Depending on the molecular weight the LIPOXOL grades are liquid or solid polymers soluble in water. They are produced by the addition of ethylene oxide to ethylene glycol.
Synonyms	PEG, Macrogol, α-Hydro-ω-hydroxypoly-(oxy-1,2-ethynediyl), Polyoxyethylene glycol
CAS-Number	[25322-68-3]
Formula	$HO-(CH_2CH_2O)_n-H$, n = Number of ethylene oxide units
Grades	The LIPOXOL grades are available with an average molecular weight of 200-8000 g/mol. The average molecular weight is given in the product name.

Product name	Number of ethylene oxide units
LIPOXOL 200	4
LIPOXOL 300	6
LIPOXOL 400	8
LIPOXOL 600	12
LIPOXOL 1000	20
LIPOXOL 1500	32
LIPOXOL 2000	40
LIPOXOL 3000	60
LIPOXOL 3350	75
LIPOXOL 4000	90
LIPOXOL 6000	150
LIPOXOL 8000	180

For the pharmaceutical and cosmetic industries, we offer the LIPOXOL MED series. The LIPOXOL MED grades satisfy the current requirements of the Pharmacopoeias Ph. Eur. and USP/NF. For more information on the LIPOXOL MED grades please refer to the product information LIPOXOL MED.

2. Properties

LIPOXOL	200	300	400	600	1000	1500	Unit	Test method
Product data								
Appearance at 25°C	clear, colourless liquid				solid	-	-	visual
Appearance at 20°C	-	-	-	-	-	solid	-	visual
Colour number (APHA)	≤ 20	≤ 20	≤ 20	-	-	-	mg Pt/l	DIN EN 1557
Colour number (APHA, 25% in water)	-	-	-	≤ 15	≤ 15	≤ 15	mg Pt/l	DIN EN 1557
Hydroxyl number	534 – 590	356 – 394	267 – 295	178 – 197	107 – 118	70 – 80	mg KOH/g	DIN EN 13926
Average molar mass	190 - 210	285 - 315	380 - 420	570 – 630	950 – 1050	1400 – 1600	g/mol	calculated
pH (10% in water)	4.5 – 7.5	4.5 – 7.5	4.5 – 7.5	4.5 – 7.5	4.5 – 7.5	4.5 – 7.5	-	DIN EN 1262
Water	≤ 0.4	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	% by mass	DIN EN 13267
General product description								
Solidification range	-55 up to -40	-20 up to -10	4 – 8	15 – 25	36 – 40	42 – 48	°C	DIN ISO 3841
Acid number	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	mg KOH/	DIN EN ISO 2114
Solubility in water at 20°C	complete	complete	complete	complete	ca. 750	ca. 630	g/l	-
Viscosity at 20°C	60 - 70	80 – 105	105 – 130	-	-	35 – 50	mPa s	DIN 53105
Viscosity at 20°C (50% in water)	-	-	-	15 – 20	24 – 29	ca.1.088	mPa s	DIN 51757
Density at 20°C	1.124	1.125	1.126	1.126	-	ca. 0.5	g/cm³	-
Density at 20°C (50% in water)	-	-	-	1.086	ca. 1.088		g/cm³	-
Ash content	ca. 0.05	ca. 0.05	ca. 0.05	ca. 0.05	ca. 0.05	ca. 0.05	% by mass	DIN 51575
Surface tension (10% in water) at 25°C	ca. 55	ca. 59	ca. 59	ca. 59	ca. 54	ca. 57	mN/m	-
Flash point (ca.)	180	220	240	270	260	260	°C	DIN ISO 2592
Ignition temperature (ca.)	350	370	370	380	420	420	°C	DIN 51794

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Product information

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LIPOXOL

LIPOXOL	2000	3000	3350	4000	6000	8000	Unit	Test Method
Product data (specification)								
Appearance at 20°C	solid-							visual
Colour number (APHA, 25% in water)	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	≤ 15	mg Pt/l	DIN EN 1557
Hydroxyl number	51 - 62	34 – 42	30 – 38	26 – 31	17 – 21	12.5 – 16	mg KOH/g	DIN EN 13926
Average molar mass	1800 - 2200	2700 – 3300	3000 – 3700	3600 – 4400	5400 – 6600	7000 – 9000	g/mol	calculated
pH (10% in water)	4.5 – 7.5	4.5 – 7.5	4.5 – 7.5	4.5 – 7.5	4.5 – 7.5	4.5 – 7.0	-	DIN EN 1262
Water	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	≤ 0.5	% by mass	DIN EN 13267
General product description								
Solidification range	47 - 52	50 – 56	53 – 57	53 – 58	55 – 61	55 – 62	°C	DIN ISO 3841
Acid number	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	≤ 0.2	mg KOH/g	DIN EN ISO
Solubility in water at 20°C	ca. 600	ca. 550	ca. 560	ca. 500	ca. 500	ca. 500	g/l	-
Viscosity at 20°C (50% in water)	47 – 60	70 – 110	83 – 120	115 - 170	200 - 270	260 - 510	mPa s	DIN 53105
Density at 20°C (50% in water)	ca. 1,088	ca. 1.088	ca. 1.089	ca. 1.090	ca. 1.090	ca. 1.090	g/cm^3	DIN 51757
Bulk density (flakes)	ca. 0,5	ca. 0.5	ca. 0.5	ca. 0.5	ca. 0.49	ca. 0.55	g/cm^3	-
Bulk density (powder)	-	-	-	ca. 0.51	ca. 0.55	-	g/cm^3	-
Ash content	ca. 0,05	ca. 0.05	ca. 0.05	ca. 0.05	ca. 0.05	ca. 0.05	% by mass	DIN 51575
Surface tension (10% in water) at 25°C	54 - 57	ca. 57	ca. 54	ca. 51	ca. 55	ca. 60	mN/m	-
Flash point (ca.)	260	250	250	250	250	250	°C	DIN ISO 2592
Ignition temperature (ca.)	420	420	420	420	420	420	°C	DIN 51794

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3. Physical properties

The physical properties of the LIPOXOL grades depend on their molecular weight.

Molar mass LIPOXOL	Solidification range	Viscosity	Solubility	Hygroscopicity	Vapour pressure
200	lower	lower	higher	higher	higher
300	↓	↓	↑	↑	↑
400	↓	↓	↑	↑	↑
600	↓	↓	↑	↑	↑
1000	↓	↓	↑	↑	↑
1500	↓	↓	↑	↑	↑
2000	↓	↓	↑	↑	↑
3000	↓	↓	↑	↑	↑
3350	↓	↓	↑	↑	↑
4000	↓	↓	↑	↑	↑
6000	↓	↓	↑	↑	↑
8000	higher	higher	lower	lower	lower

Physical form

The temperature of the melting and solidification range of the LIPOXOL grades increases with growing molecular weight. LIPOXOL 200, 300 and 400 are liquids at room temperature. The solidification range of LIPOXOL 600 and 1000 is in the range of room temperature. Both products show a paste like consistency. Starting with an average molecular weight of 1500 g/mol and higher the LIPOXOL grades are solid at room temperature. The solidification ranges are given in the tables on pages 2 and 3.

Viscosity

Above the melting temperature LIPOXOL grades show Newtonian flow behaviour, i.e. the viscosities are independent of the shear rate. The viscosities of the LIPOXOL grades increase with increasing average molecular weight (see figure 1). The viscosities of aqueous solutions of LIPOXOL grades increase with increasing concentration and increasing average molecular weight (see figures 2-4). The density of molten LIPOXOL grades and of their solutions is almost independent of their molecular weight. Increasing the temperature results in decreasing of the density of molten LIPOXOL grades from 1.12 g/cm^3 at 20°C to 1.06 g/cm^3 (see figure 7). The kinematic viscosity, given in [mm^2/s] can be converted into the dynamic viscosity [mPas] by reference to the density of the substances.

$$\eta \ [\text{mm}^2/\text{s}] \quad \frac{\eta \ [\text{mPas}]}{\text{Density} \ [\text{g/cm}^3]}$$

Solubility

An important property of the LIPOXOL grades is their readily solubility in water. The liquid LIPOXOL grades give clear solutions with water in all mixing proportions. With increasing molecular weight the solubility in water is slightly lowered. However, even the solubility of LIPOXOL 8000 in water is 500 g/l. The LIPOXOL grades are soluble in polar organic solvents like alcohols, benzene, glycerine glycol and chloroform. No or slight solubility is given in aliphatic hydrocarbons, ethers and fats.

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Hygroscopicity

LIPOXOL grades are hygroscopic and therefore take up moisture from air when stored open. Due to this behaviour LIPOXOL grades are used as moisturisers. The hygroscopicity of the LIPOXOL grades decreases with increasing molecular weight.
The hygroscopicity of the LIPOXOL grades must be considered for the storage (see chapter 6). They should be stored only in well sealed containers in a dry place.

Vapour pressure/Stability

The vapour pressure of LIPOXOL grades is very low and diminishes with increasing molecular weight. High temperatures result only in a low increase of vapour pressure in case of LIPOXOL grades with low molecular weight. (see figure 6). Because the LIPOXOL grades are not volatile, they are important auxiliaries in applications where persistent moisturizing or plasticizer effects are of importance.
In the absence of oxygen LIPOXOL grades are stable up to temperatures of approx. 250°C. The good stability of the LIPOXOL grades qualifies them as heat transfer fluids. The degradation is mainly influenced by the presence of oxygen. If the LIPOXOL grades are exposed to oxygen for a longer time at a temperature of more than 100°C the addition of antioxidants is recommended. The thermal degradation of LIPOXOL grades does not give incrustations or deposits. Degradation of LIPOXOL grades results in volatile components.

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LIPOXOL

4. Figures

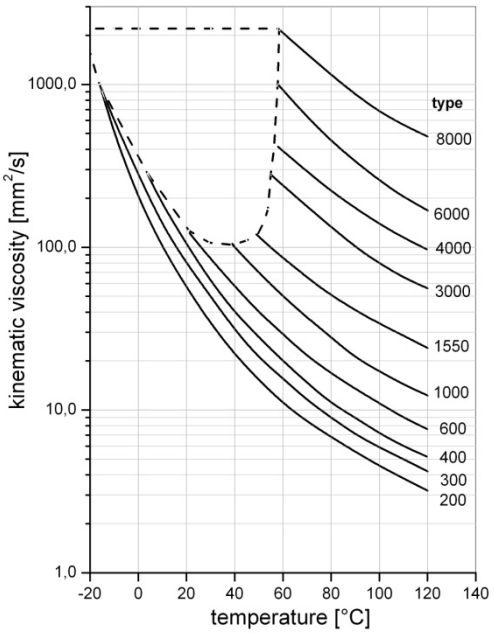

***Fig. 1**: kinematic viscosity of LIPOXOL grades*

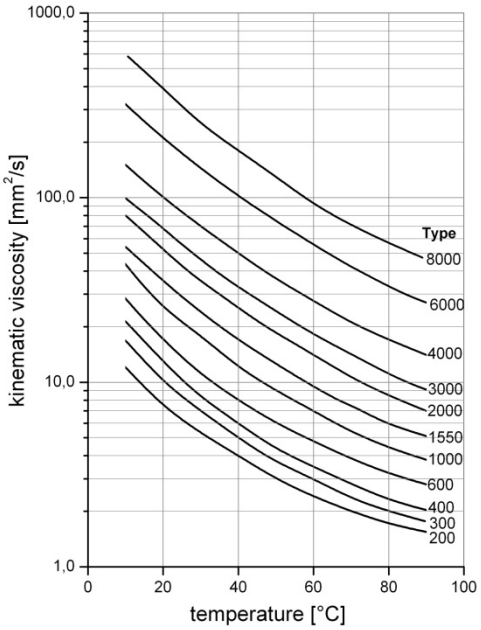

***Fig. 2**: kinematic viscosity of LIPOXOL grades 50%*

)

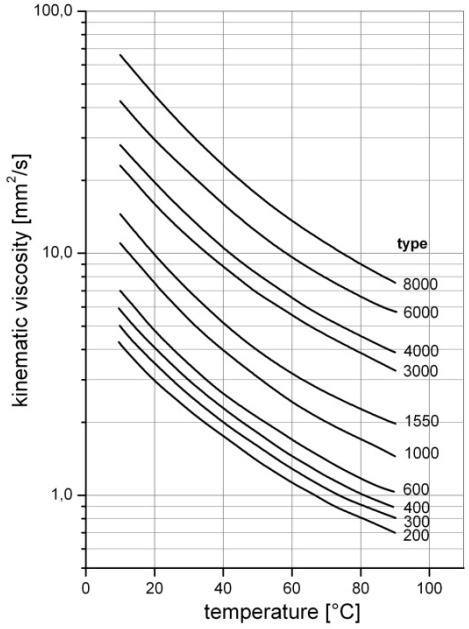

Fig. 3: kinematic viscosity of LIPOXOL grades

(30% LIPOXOL in aqueous

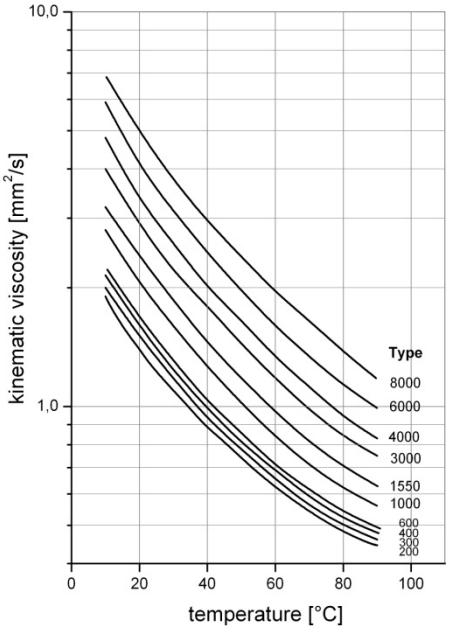

Fig. 4: kinematic viscosity of LIPOXOL grades

(10% LIPOXOL in aqueous

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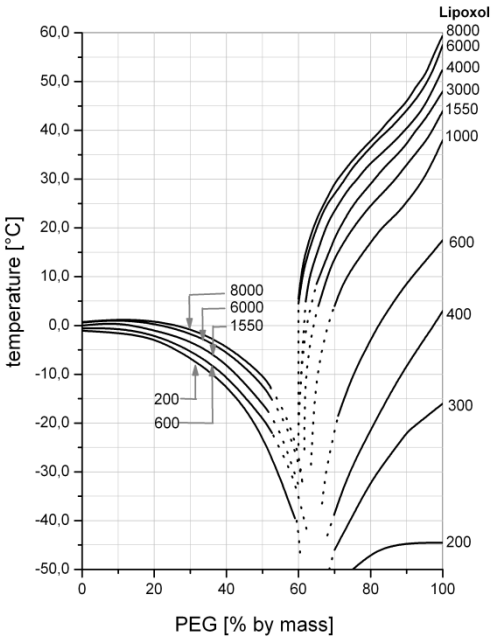

***Fig. 5**: Solidification temperature of aqueous LIPOXOL-solution*

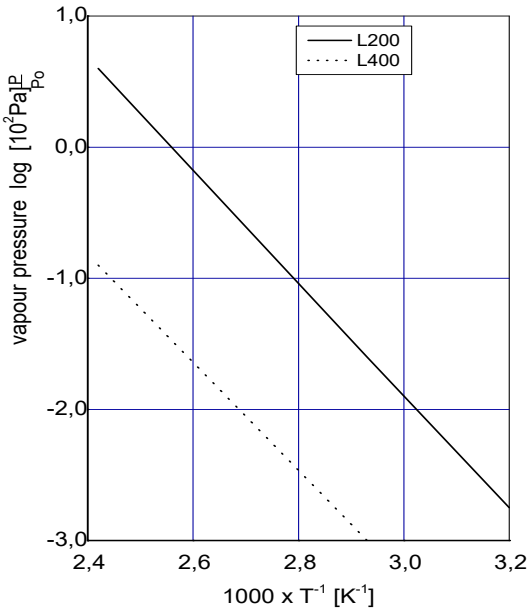

***Fig. 6**: Vapour pressure of LIPOXOL 200 and LIPOXOL 400*

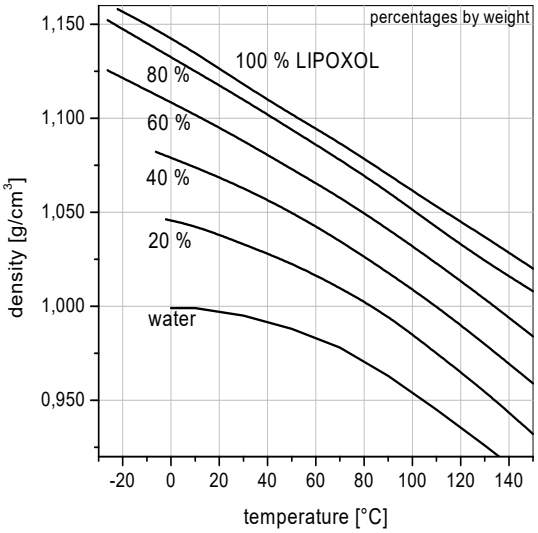

***Fig. 7**: Density aqueous LIPOXOL-solution as function of temperature*

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5. Application and function

The LIPOXOL grades are essential auxiliaries in numerous application fields like household products, metal working, ceramics, plastics or wood treatments. The LIPOXOL grades provide a unique property profile combining high water solubility, lubricity, low toxicity with excellent solvent properties. In addition to their value as auxiliaries they are intermediates for the manufacture of resins, textile auxiliaries or emulsifiers.

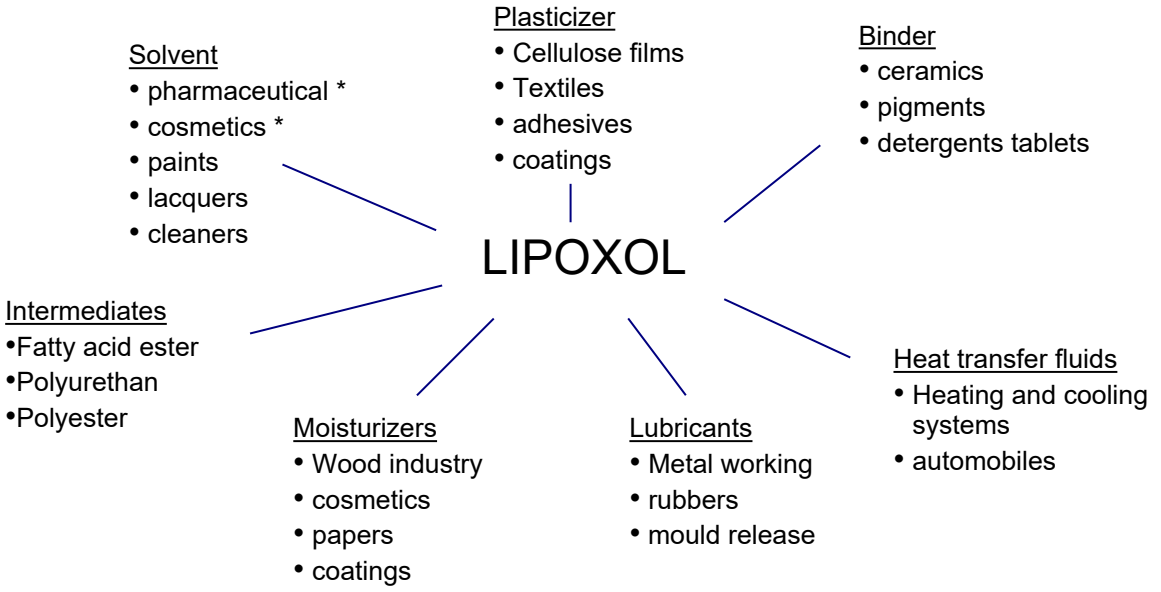

Figure 8: Key functions of LIPOXOL grades in individual applications (*LIPOXOL MED grades)

The excellent **solvent properties** of LIPOXOL grades are important in cosmetics, pharmaceutical preparations, paints, lacquers or liquid household products. Due to their viscosity reducing effect LIPOXOL 200, 300 and 400 are used as solvents in cleaners.

The **lubricating properties** of LIPOXOL grades and their derivatives make them important for metal working. They are components for lubricants in cases where physiological safety and non irritation to skin are required. LIPOXOL grades also add the necessary lubrication to the processes of the rubber industry and allow moulded pieces to be removed from the moulds easily.

LIPOXOL grades show excellent **moisturizing and plasticizing** effects. LIPOXOL 200 to 1500 is used in the wood industry to prevent the drying and cracking of wood and maintain its flexibility. This dimensionally stabilised high quality wood is used for furniture.

LIPOXOL 200, 300 and 400 serve as moisturizers and plasticizer for adhesives and coatings to remain these materials elastic for a long period of time.

The **binder and plasticizer properties** are utilized in the ceramics and pigment industry. For many granulation processes they are important auxiliaries since they bind the ingredients and impart plasticity to granules. For these reasons LIPOXOL grades are also used in the production of detergent powders and tablets.

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Liquid LIPOXOL grades are used as **heat transfer fluids**. In situations where a good water solubility, an easy cleaning procedure and a low environmental impact is important, e.g. with laboratory thermostats, LIPOXOL grades are favoured over other heat transfer fluids.

The LIPOXOL grades are important **intermediates** for fatty acid esters, polyurethanes and polyesters. The fatty acid esters are of industrial importance for example in the textile and leather industry where they are used as softeners, antistatic agents, wetting or finishing agents.

The reaction of LIPOXOL grades with diisocyanates results in polyurethanes (PUR). LIPOXOL grades are used as components for the manufacture of elastic polyurethane foam materials.

Application	*important properties*								*Polyethylene glycols*											
	environmental & human safety	*solvent properties*	*water solubility*	*viscosity modifying*	*solidification range*	*lubricity*	*hygroscopicity*	*chemical structure*	*LIPOXOL 200*	*LIPOXOL 300*	*LIPOXOL 400*	*LIPOXOL 600*	*LIPOXOL 1000*	*LIPOXOL 1500*	*LIPOXOL 2000*	*LIPOXOL 3000*	*LIPOXOL 3350*	*LIPOXOL 4000*	*LIPOXOL 6000*	*LIPOXOL 8000*
Adhesive	•			•	•				•	•	•	•	•	•	•	•	•	•	•	•
Antistatic agent	•						•		•	•	•	•	•	•	•	•	•	•	•	•
Ceramic glaze	•	•		•			•				•	•	•	•	•	•	•	•	•	•
Heat transfer medium	•		•		•				•	•	•									
Ink	•	•	•			•	•		•	•	•	•								
Intermediate	•	•	•					•	•	•	•	•	•	•	•	•	•	•	•	•
Lubricants	•			•		•			•	•	•	•	•	•	•	•	•	•	•	•
Moisturizer	•						•		•	•	•	•								
Detergents	•	•	•															•	•	•
Mould release	•		•	•		•			•	•	•	•	•	•	•	•	•	•	•	•
Paint	•	•		•					•	•	•	•	•	•	•	•	•	•	•	•
Paper	•		•				•	•	•	•	•	•	•	•						
Plasticizer	•							•	•	•	•	•	•							
Detergent tablet binder	•		•	•		•									•	•	•	•	•	•
Viscosity modifier	•		•	•					•	•	•									
Wood processing	•	•					•	•			•	•	•	•						

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LIPOXOL

6. Transport and storage

The LIPOXOL grades are relatively easy to store and to processing since they have high flash points and are not corrosive to most common construction materials. Due to the different solidification temperatures the LIPOXOL grades are offered as liquids, solids, flakes and in molten form.

The lower molecular weight LIPOXOL grades (200 to 1500) are offered in steel drums. In addition, LIPOXOL 200 to 1000 are offered in containers. LIPOXOL 1500 to 8000 are supplied as flakes in polyethylene sacks or big bags. All LIPOXOL grades can also be delivered in road tankers as liquids or in molten form.

If the higher molecular LIPOXOL grades are stored in molten form the storage temperature should be chosen 10-20°C above the solidification range. For short storage times (one month at most) storage in the presence of air is acceptable. If the storage time is longer it is recommended to store the products under a nitrogen atmosphere. This helps to keep the product quality constant. As material for storage tanks stainless steel is recommended. The usage of Alumina is also possible.

Delivered drums or containers containing LIPOXOL grades should be kept sealed until use. The lower molecular weight LIPOXOL grades can be stored inside a warm building without provision of heating. For melting the solid LIPOXOL grades it is recommended not to use excessively high temperatures. Controlled heating chambers or water baths are advisable to avoid local overheating.

The sacks or big bags containing LIPOXOL grades as flakes should be stored in a dry and cold place and kept sealed until use. Because the flakes soften and melt at elevated temperatures storage next to a heat source and exposure to direct sunlight should be avoided.

Product	Packaging
LIPOXOL 200	Steel drum à 230 kg / Container 1 t / Road tanker
LIPOXOL 300	Steel drum à 230 kg / Container 1 t / Road tanker
LIPOXOL 400	Steel drum à 230 kg / Container 1 t / Road tanker
LIPOXOL 600	Steel drum à 230 kg / Container 1 t / Road tanker
LIPOXOL 1000	Steel drum à 220 kg / Road tanker (Melt)
LIPOXOL 1500	Steel drum à 220 kg / Flakes in Polyethylene sack à 25 kg (1t on pallets) / 500 kg Big Bag / Road tanker (Melt)
LIPOXOL 2000	Steel drum à 220 kg / Flakes in Polyethylene sack à 25 kg (1t on pallets) / 500 kg Big Bag / Road tanker (Melt)
LIPOXOL 3000	Flakes in Polyethylene sack à 25 kg (1t on pallets) / Road tanker (Melt)
LIPOXOL 3350	Flakes in Polyethylene sack à 25 kg (1t on pallets) / Road tanker (Melt)
LIPOXOL 4000	Flakes in Polyethylene sack à 25 kg (1t on pallets) / 500 kg Big Bag / Powder in Polyethylene sack à 25 kg (500 kg in carton box on pallets) / 500 kg Big Bags / Road tanker (Melt)
LIPOXOL 6000	Flakes in Polyethylene sack à 25 kg (1t on pallets) / 500 kg Big Bag / Road tanker (Melt)

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LIPOXOL

LIPOXOL 8000	Flakes in Polyethylene sack à 25 kg (1t on pallets) / 500 kg Big Bag / Road tanker (Melt)

7. Ecology and toxicity

The LIPOXOL grades are non-hazardous substances.
They are practically non-toxic to daphnia, fish, algae and bacteria and are readily biodegradable.
The products have a low oral and dermal acute toxicity, are not or only slightly irritating to the skin or to the eyes and are no skin sensitizers.

8. Safety data sheets

Data on toxicity, ecotoxicity as well as transport classes and labelling can be obtained from the material safety data sheets.

Change of History

02/2026	Change in Managing director
04/2026	LIPOXOL 2000 added

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right to make any changes according to technological progress or further developments. The customer is not released from the obligation to conduct careful inspection and testing of incoming goods. Reference to trade names used by other companies is neither a recommendation, nor is it intended to suggest that similar products could not be used. All our business transactions shall exclusively be governed by our General Sales Conditions.

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